

**IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF TEXAS  
WACO DIVISION**

**JOLED INC.,**

**Plaintiff,**

**v.**

**SAMSUNG ELECTRONICS  
AMERICA, INC., SAMSUNG  
DISPLAY CO., LTD., and SAMSUNG  
ELECTRONICS CO., LTD.**

**Defendants.**

**Civil Action No.: 6:20-CV-00559**

**JURY TRIAL DEMANDED**

**COMPLAINT FOR PATENT INFRINGEMENT**

Plaintiff JOLED Inc. (“Plaintiff” or “JOLED”) complains and alleges as follows against Defendants Samsung Electronics America, Inc., Samsung Display Co., Ltd., and Samsung Electronics Co., Ltd. (collectively, “Defendants” or “Samsung”).

**NATURE OF THE ACTION**

1. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq.*
2. JOLED has filed this lawsuit to stop Samsung’s unlawful infringement of JOLED’s patented inventions and to obtain damages and other relief.

**THE PARTIES**

3. JOLED is a corporation organized and existing under the laws of Japan with its principal place of business located at Metlife Building 10F, Kandanishiki-cho 3-23, Chiyoda-ku, Tokyo, Japan, 101-0054. JOLED conducts research, development, manufacturing, and sales activities for organic light-emitting diode (“OLED”) displays. JOLED employs approximately

610 people, including at least several hundred engineers working on manufacturing and research and development with respect to OLED technology. JOLED manufactures and sells 21.6" OLED display panels to JOLED's customers for incorporation into medical diagnosis systems, among other useful products. JOLED's worldwide patent portfolio includes over 1360 U.S. patents and pending U.S. patent applications.

4. Upon information and belief, Samsung Electronics America, Inc. ("SEA") is a corporation organized and existing under the laws of the State of New York with its principal place of business at 85 Challenger Road, Ridgefield Park, New Jersey 07660. SEA may be served with process through its registered agent for service of process, CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

5. Upon information and belief, Samsung Display Co., Ltd. ("SDC") is a corporation organized and existing under the laws of the Republic of Korea, with its principal place of business at 181, Samsung-ro, Tangjeong-Myeon, Asan-City, Chungcheongnam-Do, 336-741, Republic of Korea. SDC may be served with process by serving in accordance with the Hague Convention on the Service Abroad of Judicial and Extrajudicial Documents, in accordance with Rule 4(f) of the Federal Rules of Civil Procedure.

6. Upon information and belief, Samsung Electronics Co., Ltd. ("SEC") is a corporation organized and existing under the laws of the Republic of Korea, with its principal place of business at 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742, Republic of Korea. SEC may be served with process by serving in accordance with the Hague Convention on the Service Abroad of Judicial and Extrajudicial Documents, in accordance with Rule 4(f) of the Federal Rules of Civil Procedure.

7. Upon information and belief, SEA is a wholly owned subsidiary of SEC. Upon information and belief, SDC is a majority-owned subsidiary of SEC.

8. Samsung uses, sells, and/or offers for sale within the United States, and/or imports into the United States, smartphones with electroluminescent (“EL”) displays, and more specifically OLED displays, that infringe one or more claims of the Asserted Patents (as defined below). Such Samsung smartphones are hereinafter referred to as the “Accused Products.” For example, Samsung describes its OLED display screens provided in Samsung’s Galaxy smartphones as follows: “What is OLED? Super AMOLED provides an exceptional viewing experience for you. It offers a wide range of colors with an incredible degree of color clarity which translates into far greater resolution. Given its astounding 100,000:1 contrast ratio, Super AMOLED displays will automatically adapt to various lighting environments to make it easier on the eyes while providing excellent picture quality when playing games or watching your favorite multimedia.”<sup>1</sup> For example, Samsung describes its Galaxy S9 smartphone as including a “5.8” Quad HD+ Super AMOLED (2960x1440)” display and its Samsung Galaxy S9+ smartphone as including a “6.2” Quad HD+ Super AMOLED (2960x1440)” display.<sup>2</sup>

#### **JURISDICTION AND VENUE**

9. This Court has exclusive subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

10. Venue is proper in this judicial district under 28 U.S.C. §§ 1391(a)-(d) and 1400(b). As a defendant not resident in the United States, SEC may be sued in any judicial district pursuant to 28 U.S.C. § 1391(c)(3). As a defendant not resident in the United States, SDC may be sued in

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<sup>1</sup> See <https://www.samsung.com/global/galaxy/what-is/oled/>

<sup>2</sup> See <https://www.samsung.com/global/galaxy/galaxy-s9/specs/>

any judicial district pursuant to 28 U.S.C. § 1391(c)(3). Venue in this District is also proper because a substantial part of the events giving rise to the claims in this action also occurred in this District pursuant to 28 U.S.C. § 1400(b). Defendant SEA has a regular and established place of business in this District at 12100 Samsung Boulevard, Austin, Texas 78785. On information and belief, more than thirty SEA employees or independent contractors reside in this District. Defendant SEA also has regular and established places of business at: 1301 East Lookout Drive, Richardson, Texas 75080; and 6635 Declaration Drive, Plano, Texas 75023.

11. This Court has personal jurisdiction over Samsung. Defendants SDC and SEC have established minimum contacts with the United States as a whole such that the exercise of jurisdiction would not offend traditional notions of fair play and substantial justice. Defendants SDC and SEC have purposefully directed activities at the United States, including directing the Accused Products for sale to Defendant SEA, and Samsung's distributors, dealers, resellers, and end customers (collectively, "Samsung's customers") within the United States (including within this District) and engaging in sales and marketing efforts to generate and support such sales. The claims for infringement arise out of, or relate to, those activities. In addition, Samsung has placed or contributed to placing the Accused Products into the stream of commerce via an established distribution channel with the knowledge that such Accused Products would be imported into the United States, and sold, offered for sale, and used within the United States, including within this District. Defendant SEA has committed and continues to commit acts of patent infringement in this District, and has harmed and continues to harm JOLED in this District by selling and offering for sale Accused Products in this District and by inducing infringement by Samsung's customers in this District. Upon information and belief, Samsung has used the Accused Products in an infringing manner within this District (e.g., via testing and demonstration).

12. Defendants are jointly and severally liable for infringing the Asserted Patents (as defined below). Defendants' liability arises out of the same transaction, occurrence, or series of transactions or occurrences, related to the using, offering for sale, and selling the Accused Products within the United States, and the importing of the Accused Products into the United States. As a result, this action involves questions of law and fact that are common to all Defendants.

### **THE ASSERTED PATENTS**

13. On August 8, 2017, the United States Patent and Trademark Office (the "PTO") duly and legally issued U.S. Patent No. 9,728,130 B2 ("the '130 Patent"), entitled "EL Display Apparatus."

14. On March 20, 2018, the PTO duly and legally issued U.S. Patent No. 9,922,597 B2 ("the '597 Patent"), entitled "EL Display Apparatus."

15. On June 12, 2018, the PTO duly and legally issued U.S. Patent No. 9,997,108 B1 ("the '108 Patent"), entitled "EL Display Apparatus."

16. On November 20, 2018, the PTO duly and legally issued U.S. Patent No. 10,134,336 B2 ("the '336 Patent"), entitled "EL Display Apparatus."

17. On February 5, 2019, the PTO duly and legally issued U.S. Patent No. 10,198,992 B2 ("the '992 Patent"), entitled "EL Display Apparatus."

18. JOLED is the owner by assignment of the '130 Patent, the '597 Patent, the '108 Patent, the '336 Patent, and the '992 Patent (collectively, the "Asserted Patents").

19. JOLED has been and is in compliance with 35 U.S.C. § 287(a). Specifically, JOLED has not made, offered for sale, or sold any articles patented under the Asserted Patents within the United States, nor imported any articles patented under the Asserted Patents into the United States. Moreover, JOLED is not aware of any articles patented under the Asserted Patents

that have been made, offered for sale, or sold within the United States, or imported into the United States, by any person for or under JOLED.

### **THE ACCUSED PRODUCTS**

20. The Accused Products are Samsung smartphones with EL displays, and more specifically OLED displays, including, but not limited to, Samsung Galaxy smartphones. The Accused Products include at least the following models: Samsung Galaxy Note 4, Samsung Galaxy Note 4 Edge, Samsung Galaxy Note 5, Samsung Galaxy Note 7, Samsung Galaxy Note 8, Samsung Galaxy Note 9, Samsung Galaxy Note 10, Samsung Galaxy Note 10+, Samsung Galaxy Note 10+ 5G, Samsung Galaxy S5, Samsung Galaxy S5 Plus, Samsung Galaxy S5 Mini, Samsung Galaxy S5 Active, Samsung Galaxy S5 Neo, Samsung Galaxy S6, Samsung Galaxy S6 Edge, Samsung Galaxy S6 Active, Samsung Galaxy S6 Edge+, Samsung Galaxy S7, Samsung Galaxy S7 Active, Samsung Galaxy S7 Edge, Samsung Galaxy S8, Samsung Galaxy S8 Active, Samsung Galaxy S8+, Samsung Galaxy S9, Samsung Galaxy S9+, Samsung Galaxy S10, Samsung Galaxy S10+, Samsung Galaxy S10e, Samsung Galaxy S10 5G, Samsung Galaxy S10 Lite, Samsung Galaxy S20 5G, Samsung Galaxy S20 UW, Samsung Galaxy S20+ 5G, Samsung Galaxy S20 Ultra 5G, Samsung Galaxy A50, Samsung Galaxy A20, Samsung Galaxy A71 5G, Samsung Galaxy A51, Samsung Galaxy A6, Samsung Galaxy Fold, and Samsung Galaxy Z Flip.

### **COUNT I – INFRINGEMENT OF THE METHOD CLAIM OF THE '130 PATENT**

21. JOLED hereby restates and re-alleges the allegations set forth in paragraphs 1 – 20 above and incorporates them by reference.

22. The Defendants have been and are now directly infringing and/or inducing each other and Samsung's customers to infringe the '130 Patent in this District and elsewhere in violation of 35 U.S.C. § 271 at least by using, selling, and/or offering to sell within the United

States, and/or importing into the United States, Accused Products that practice in normal operation method claim 13 of the '130 Patent.

23. Samsung has committed infringing acts without the permission, consent, authorization, or license of JOLED.

24. Samsung's infringement is literal, under the doctrine of equivalents, or both.

25. Upon information and belief, Samsung has directly infringed and continues to infringe directly method claim 13 of the '130 Patent through actions such as testing and demonstrations of the Accused Products in the United States.

26. In addition to its own direct infringement, upon information and belief, Samsung has been and is currently actively inducing and encouraging infringement of method claim 13 of the '130 Patent. Samsung's customers have infringed, and continue to infringe, method claim 13 of the '130 Patent through their use of the Accused Products. Samsung has been aware of the '130 Patent and of Samsung's infringement and Samsung's customers' infringement of the '130 Patent, since at least on or about May 15, 2020, when JOLED's counsel sent Samsung a letter attaching a copy of the '130 Patent and demanding that Samsung abate such infringement by taking a license or otherwise.

27. Upon information and belief, Samsung had knowledge of the '130 Patent before JOLED's counsel sent this letter to Samsung.

28. Samsung actively encourages its customers to infringe method claim 13 of the '130 Patent by supplying Accused Products and by encouraging the use of such Accused Products in a manner (e.g., turning on and/or operating OLED displays) that would necessarily lead to the performance of the method steps described below. For example, Samsung's customers in the United States in accordance with Samsung's instructions contained in its user manuals, perform

the claimed method and thereby directly infringe asserted claim 13 of the '130 Patent reciting such a method. These facts give rise to a reasonable inference that Samsung knowingly induces its customers to infringe method claim 13 of the '130 Patent directly, and that Samsung possesses a specific intent to cause such direct infringement.

29. Samsung and its customers infringe method claim 13 of the '130 Patent as set forth below.

30. Independent claim 13 of the '130 Patent recites:

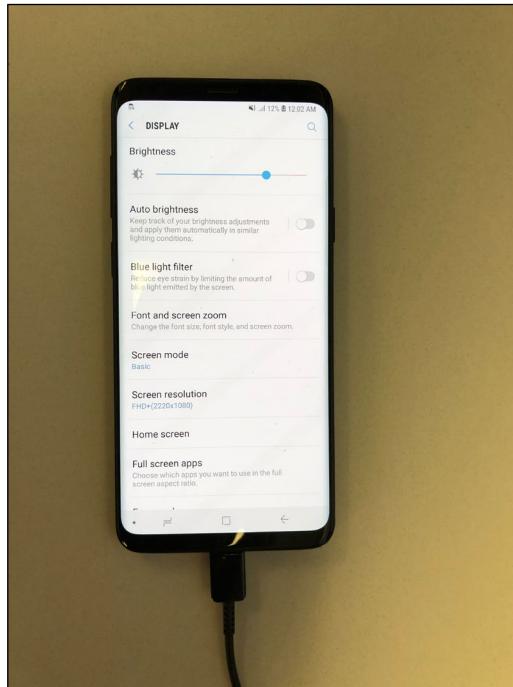
A method of controlling an EL display apparatus, the EL display apparatus comprising:

- a display screen including pixels arranged in a matrix, each of the pixels including an EL device and a pixel circuit;
- a source driver circuit configured to output a video signal applied to each of the pixels;
- a source signal line through which the video signal output from the source driver circuit is transmitted; and
- a gate driver circuit which includes a first gate driver circuit, a second gate driver circuit, a first gate signal line through which a first selection voltage or a first non-selection voltage output from the first gate driver circuit is transmitted, and a second gate signal line through which a second selection voltage or a second non-selection voltage output from the second gate driver circuit is transmitted, the pixel circuit of each of the pixels including a driving transistor configured to supply a luminescence-causing current to the EL device, a first switching transistor, and a second switching transistor, the first switching transistor being disposed on a path through which the luminescence-causing current flows, the second switching

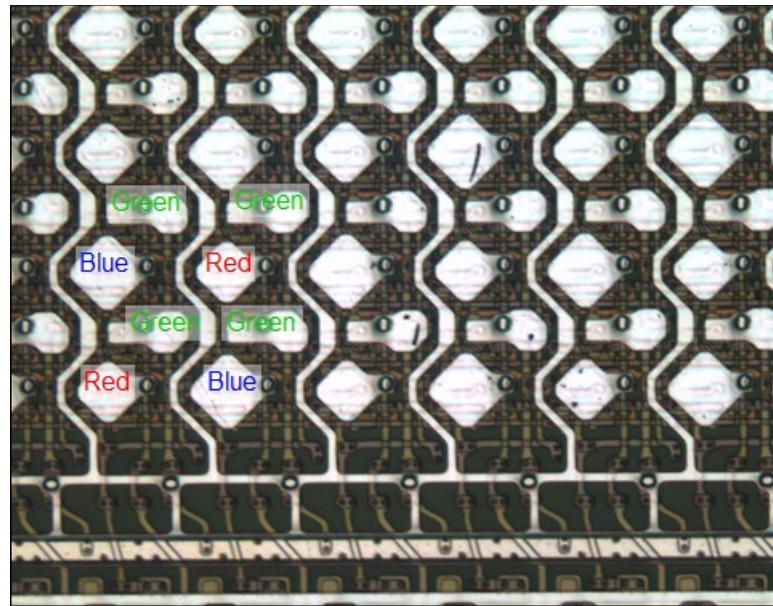
transistor being configured to apply the video signal, which is output from the source driver circuit, to the driving transistor, a gate terminal of the first switching transistor being connected to the first gate signal line, a gate terminal of the second switching transistor being connected to the second gate signal line, the source driver circuit being provided as a semiconductor chip and being attached to the EL display apparatus, an output terminal of the source driver circuit being connected to the source signal line, the gate driver circuit being configured to receive a control signal that is level-shifted by the source driver circuit, and the method comprising:

- independently on/off controlling the first switching transistor and the second switching transistor by the first gate driver circuit and the second gate driver circuit.

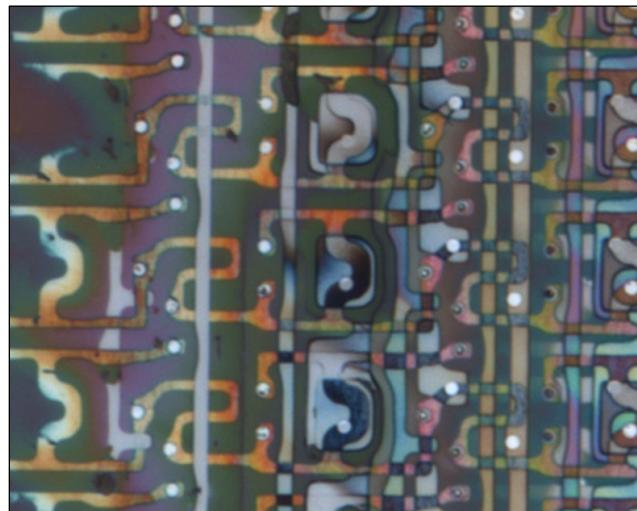
31. Samsung and its customers have performed and currently perform a method of controlling an EL display apparatus through their use of the Accused Products, including Samsung Galaxy smartphones, in the United States. For example, as shown in the photograph below, Samsung Galaxy smartphones include a controllable EL display apparatus:



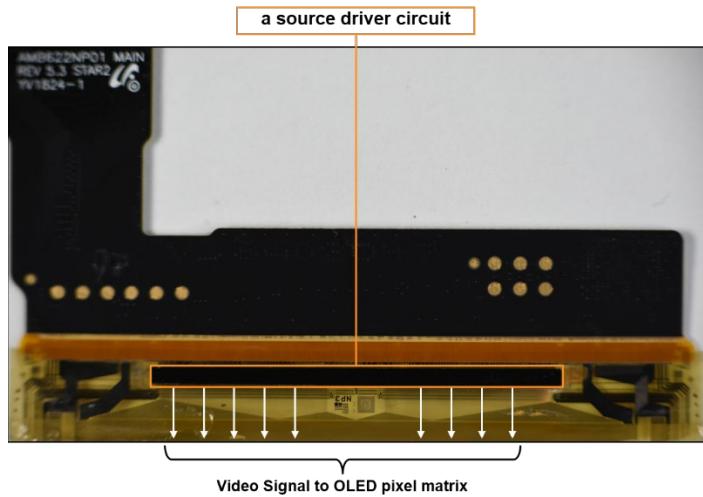
32. The Accused Products, including Samsung Galaxy smartphones, include an EL display apparatus that comprises a display screen that includes pixels arranged in a matrix, each of the pixels including an EL device and a pixel circuit. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a display screen that includes pixels arranged in a matrix:



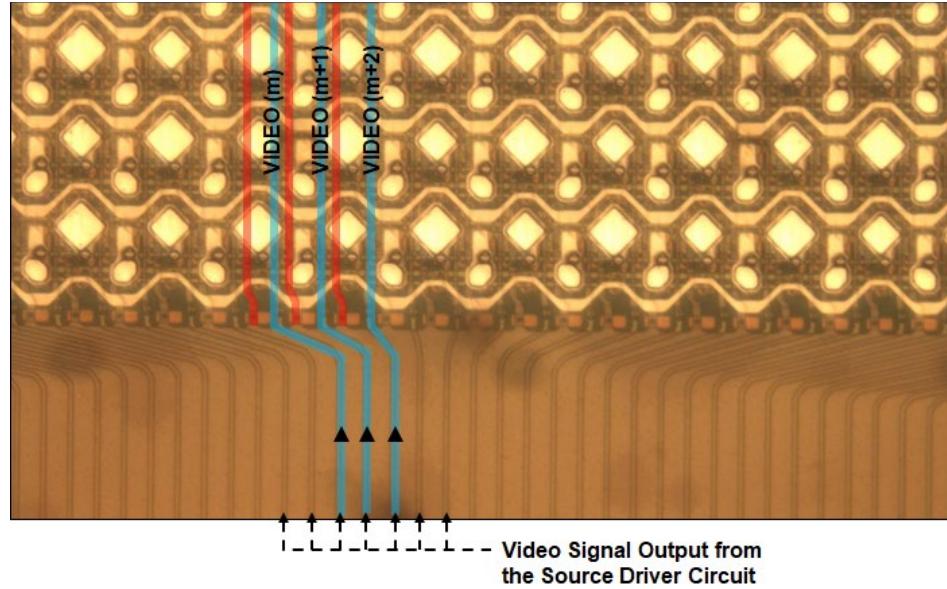
33. For example, as shown in the photograph below, in the Samsung Galaxy smartphones, each of the pixels includes an EL device and a pixel circuit:



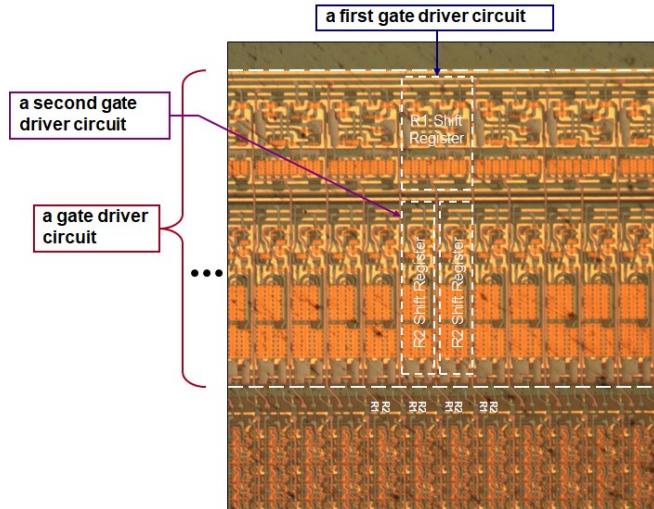
34. The Accused Products, including Samsung Galaxy smartphones, include a source driver circuit configured to output a video signal applied to each of the pixels. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a source driver circuit configured to output a video signal applied to each of the pixels:



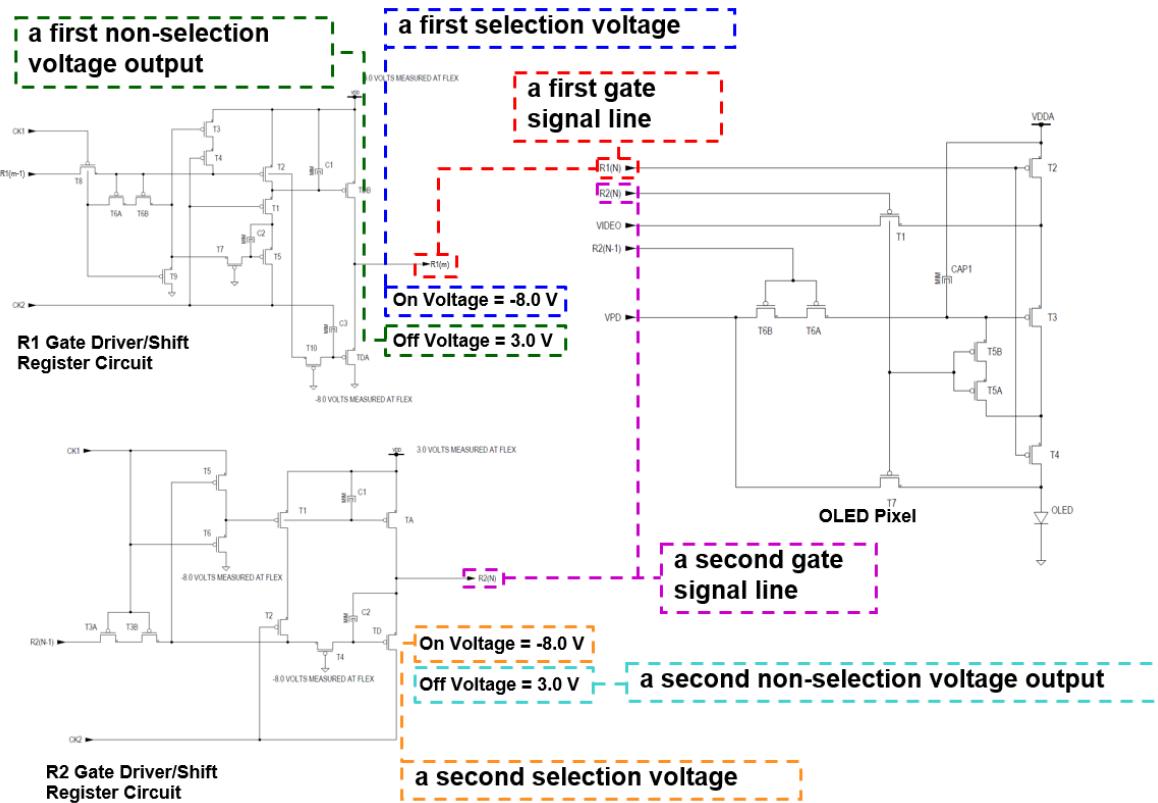
35. The Accused Products, including Samsung Galaxy smartphones, include a source signal line through which the video signal output from the source driver circuit is transmitted. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a source signal line through which the video signal output from the source driver circuit is transmitted:



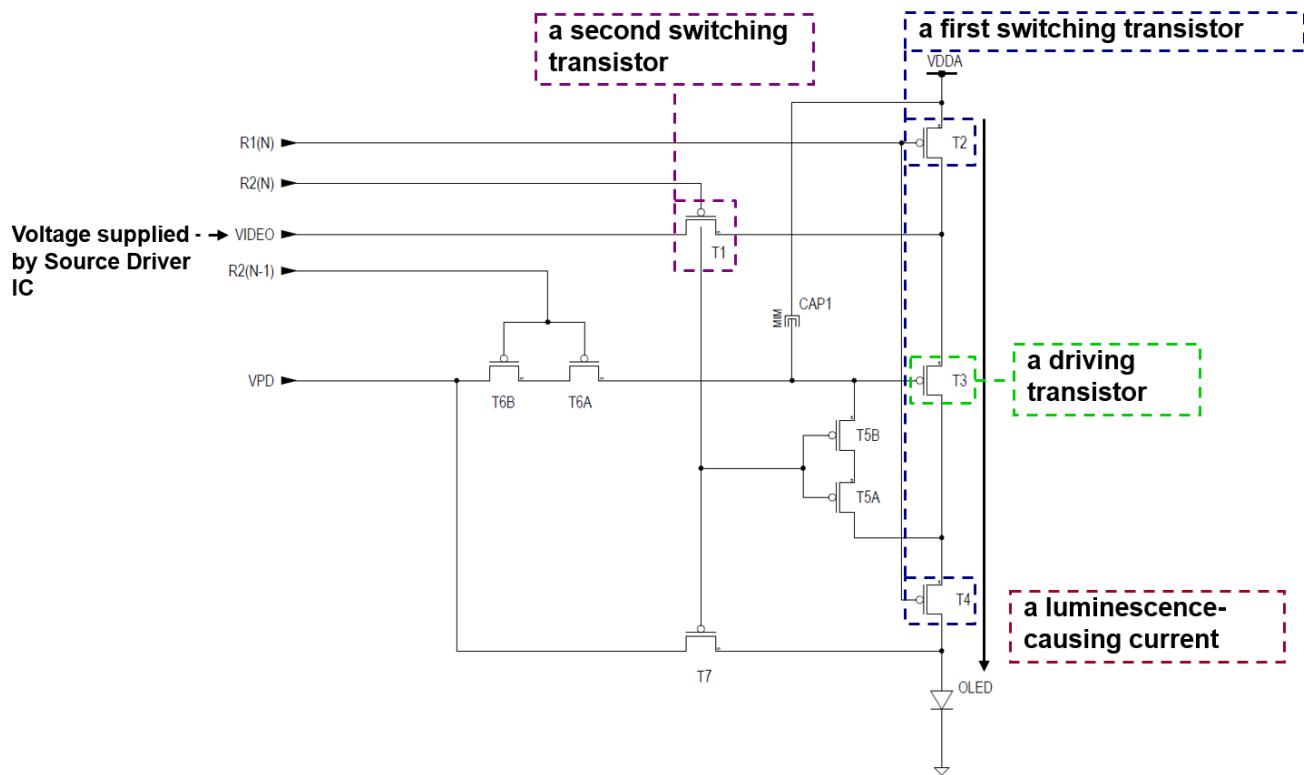
36. The Accused Products, including Samsung Galaxy smartphones, include a gate driver circuit which includes a first gate driver circuit, a second gate driver circuit, a first gate signal line through which a first selection voltage or a first non-selection voltage output from the first gate driver circuit is transmitted, and a second gate signal line through which a second selection voltage or a second non-selection voltage output from the second gate driver circuit is transmitted. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a gate driver circuit which includes a first gate driver circuit and a second gate driver circuit:



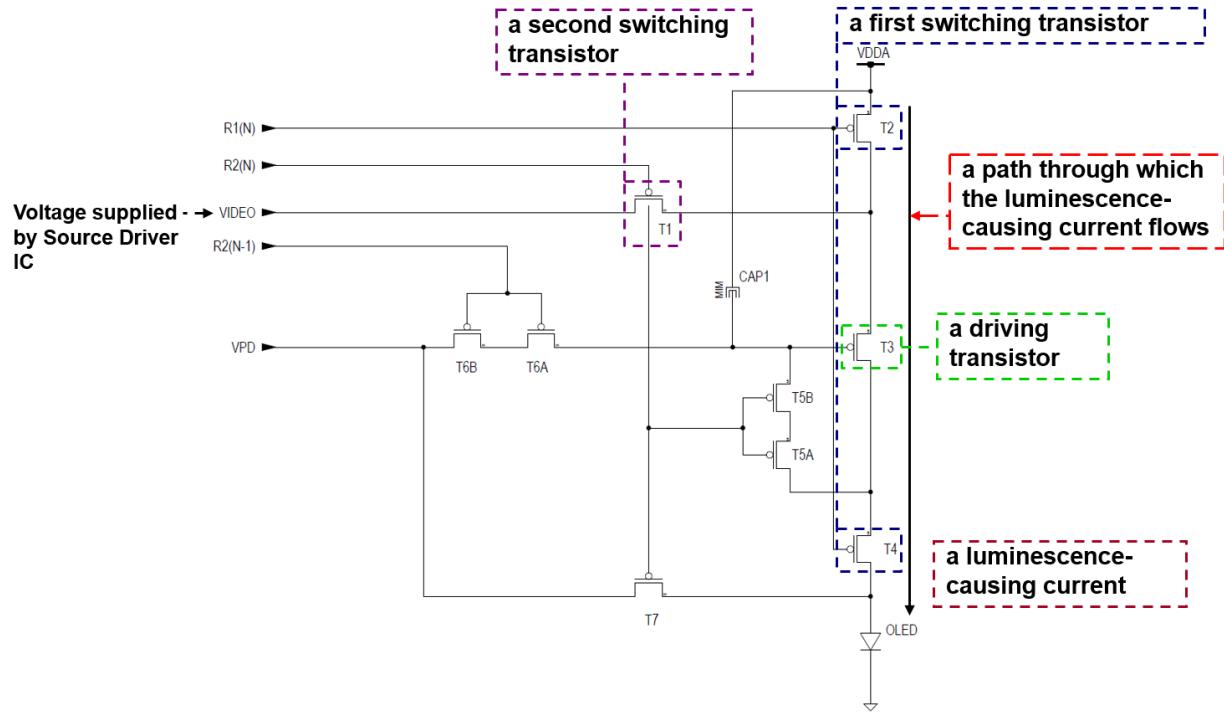
For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones include a first gate signal line through which a first selection voltage or a first non-selection voltage output from the first gate driver circuit is transmitted, and a second gate signal line through which a second selection voltage or a second non-selection voltage output from the second gate driver circuit is transmitted:



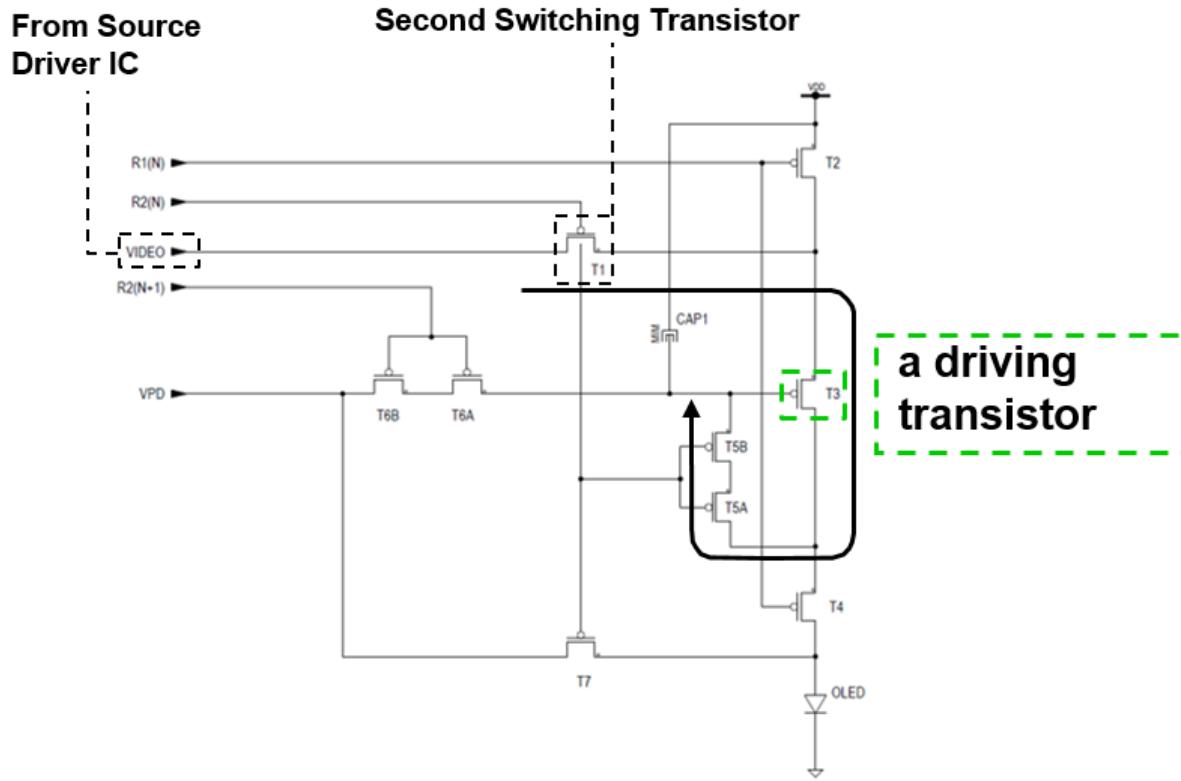
37. In the Accused Products, including Samsung Galaxy smartphones, the pixel circuit of each of the pixels includes a driving transistor configured to supply a luminescence-causing current to the EL device, a first switching transistor, and a second switching transistor. For example, as shown in the annotated circuit diagram below, in the Samsung Galaxy smartphones, the pixel circuit of each of the pixels includes a driving transistor configured to supply a luminescence-causing current to the EL device, a first switching transistor, and a second switching transistor:



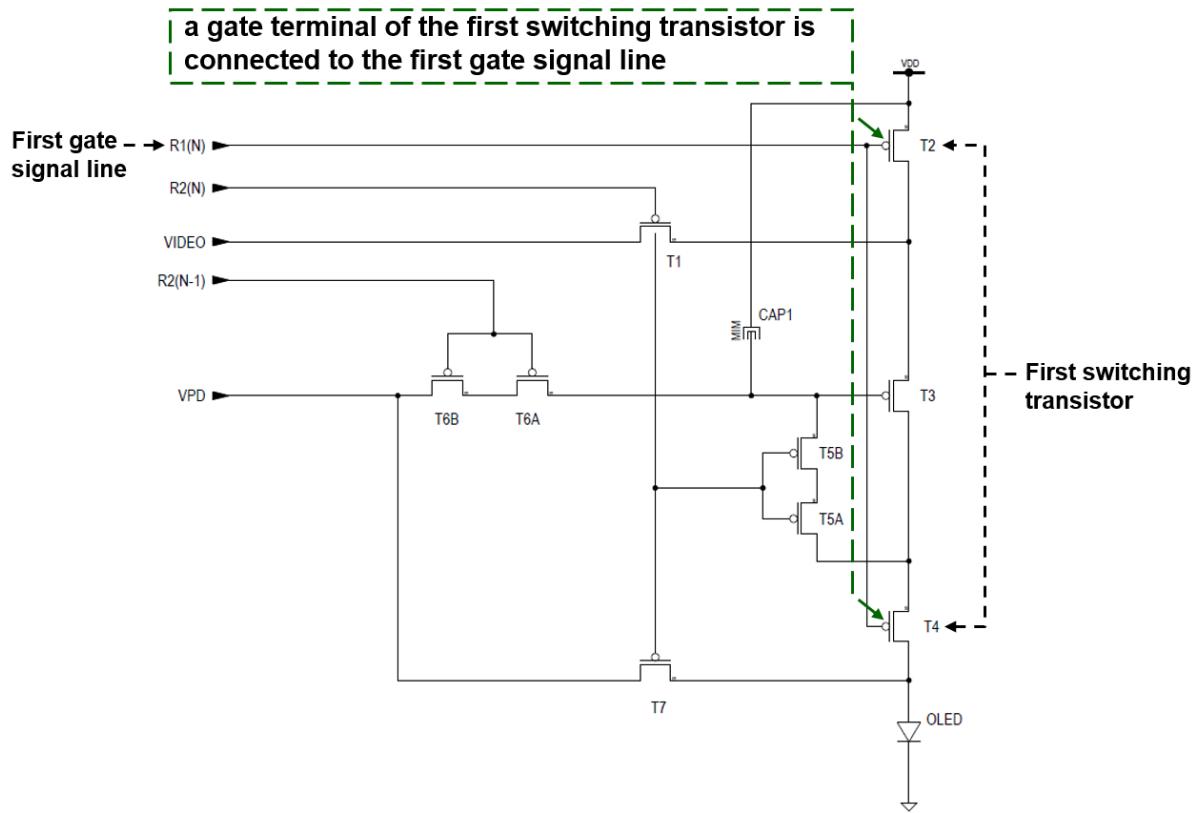
38. The Accused Products, including Samsung Galaxy smartphones, include the first switching transistor being disposed on a path through which the luminescence-causing current flows. For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones include the first switching transistor being disposed on a path through which the luminescence-causing current flows:



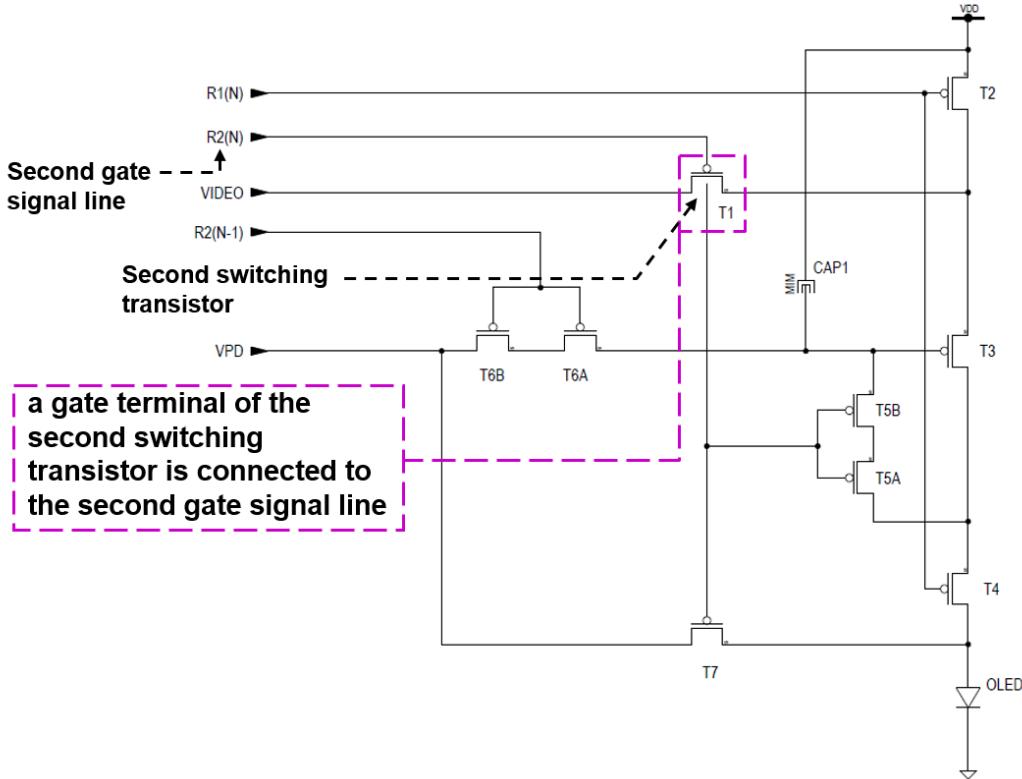
39. The Accused Products, including Samsung Galaxy smartphones, include the second switching transistor being configured to apply the video signal, which is output from the source driver circuit, to the driving transistor. For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones, include the second switching transistor being configured to apply the video signal, which is output from the source driver circuit, to the driving transistor:



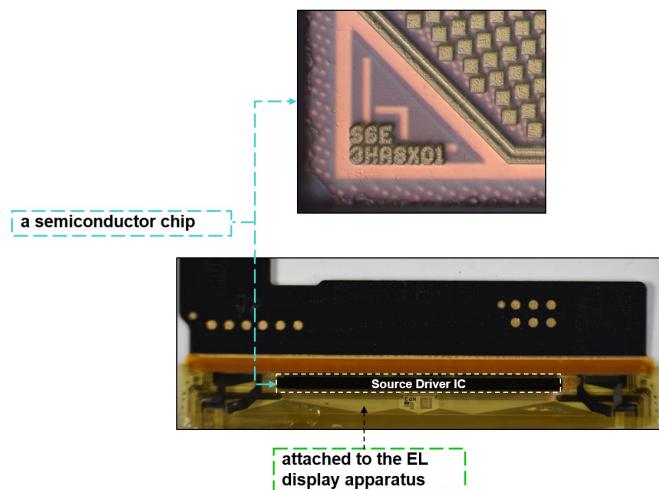
40. The Accused Products, including Samsung Galaxy smartphones, include a gate terminal of the first switching transistor being connected to the first gate signal line. For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones include a gate terminal of the first switching transistor being connected to the first gate signal line:



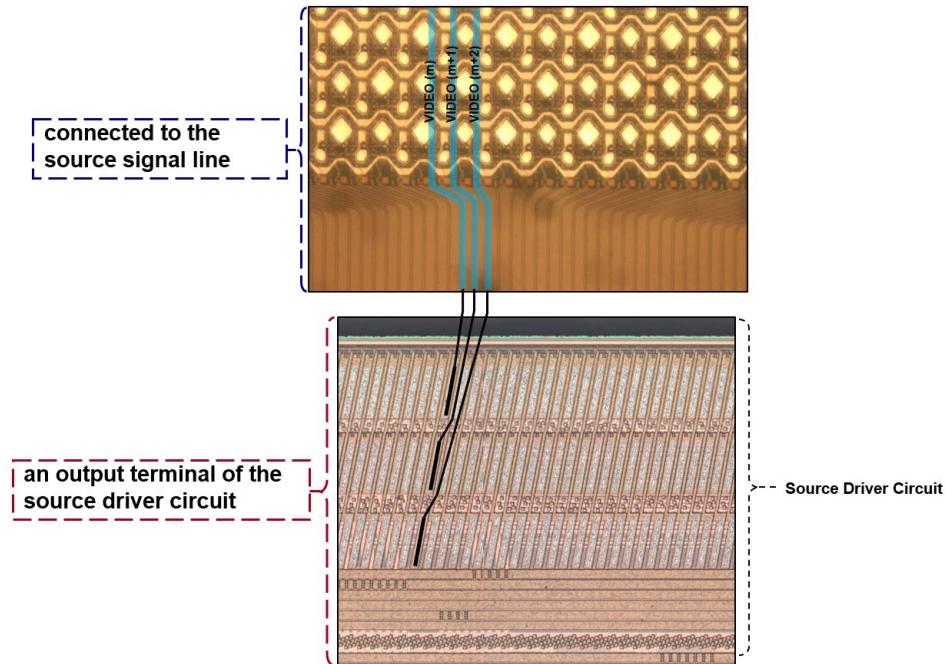
41. The Accused Products, including Samsung Galaxy smartphones, include a gate terminal of the second switching transistor being connected to the second gate signal line. For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones include a gate terminal of the second switching transistor being connected to the second gate signal line:



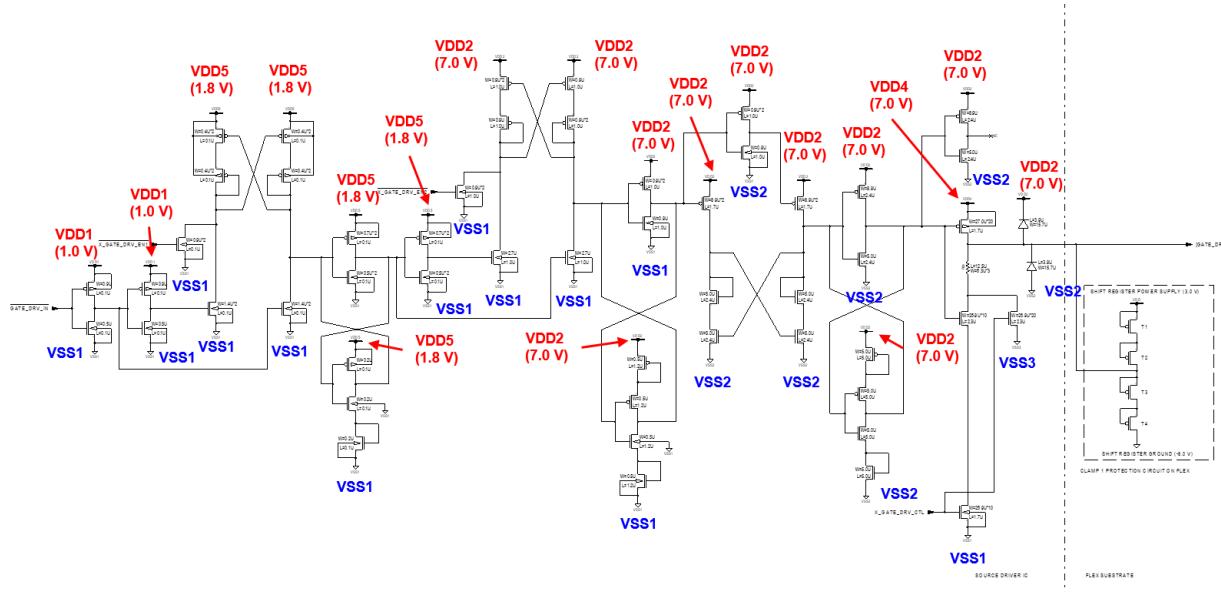
42. The Accused Products, including Samsung Galaxy smartphones, include the source driver circuit being provided as a semiconductor chip and being attached to the EL display apparatus. For example, as shown in the annotated photographs below, Samsung Galaxy smartphones include the source driver circuit being provided as a semiconductor chip and being attached to the EL display apparatus:



43. The Accused Products, including Samsung Galaxy smartphones, include an output terminal of the source driver circuit being connected to the source signal line. For example, as shown in the annotated photographs below, Samsung Galaxy smartphones include an output terminal of the source driver circuit being connected to the source signal line:



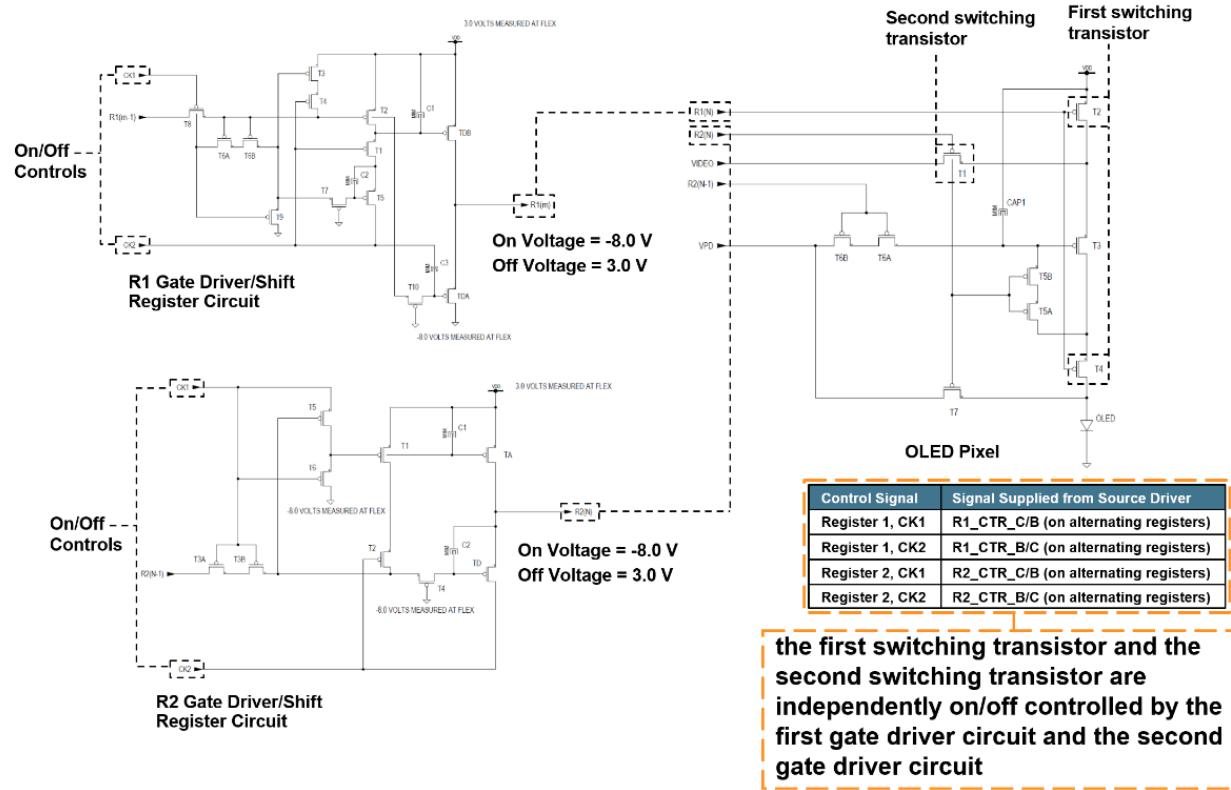
44. The Accused Products, including Samsung Galaxy smartphones, include the gate driver circuit being configured to receive a control signal that is level-shifted by the source driver circuit. For example, Samsung Galaxy smartphones include the gate driver circuit being configured to receive a control signal that is level-shifted by the source driver circuit as shown by the circuit diagram and exemplary measurements below:



Power Supply	Measured Voltage (Volts)
VDD1	1.0 V
VDD5	1.8 V
VDD2/VDD4	7.0 V

level-shifted by the source driver circuit

45. Samsung and its customers have used and currently use the Accused Products in the United States, including Samsung Galaxy smartphones, to perform a method comprising: independently on/off controlling the first switching transistor and the second switching transistor by the first gate driver circuit and the second gate driver circuit. For example, as shown in the annotated circuit diagram below, the operation of the OLED display in the Samsung Galaxy smartphones necessarily includes the performance of a method that includes independently on/off controlling the first switching transistor and the second switching transistor by the first gate driver circuit and the second gate driver circuit:

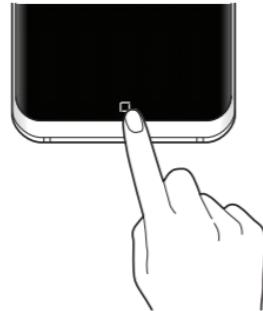


46. Samsung induces its customers to perform each of the method steps described above by instructing its customers to turn on and/or operate the OLED display in the Accused Products. For example, Samsung provides a user manual for the Samsung Galaxy S9+ at [https://images.samsung.com/is/content/samsung/p5/ca/support/mobile-devices/galaxy-s9-plus-how-do-i-access-the-user-manual-on-my-samsung-galaxy-s9-plus/pdf/SM-G96X\\_UG\\_EN4.pdf](https://images.samsung.com/is/content/samsung/p5/ca/support/mobile-devices/galaxy-s9-plus-how-do-i-access-the-user-manual-on-my-samsung-galaxy-s9-plus/pdf/SM-G96X_UG_EN4.pdf). The user manual specifically instructs Samsung's customers to turn on the screen using the Home button to activate the "Always on Display" as shown below:

### Turning on the screen using the Home button

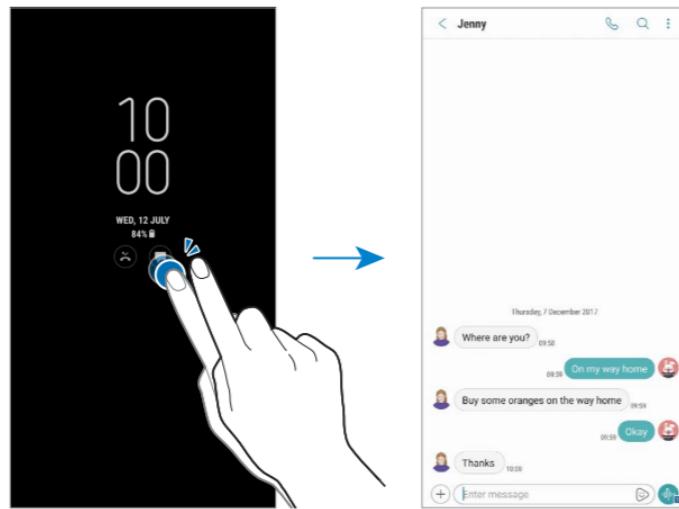
Hard press the Home button or the Home button area to turn on the screen.

On the Always On Display, you can also turn on the screen by double-tapping the Home button.



### Opening notifications on the Always On Display

When you receive message, missed call, or app notifications, notification icons will appear on the Always On Display. Double-tap a notification icon to view its notification.



47. Upon information and belief, Samsung has committed and continues to commit all of the above acts of infringement despite Samsung's lack of a good faith belief that method claim 13 of the '130 Patent is not infringed, invalid, or unenforceable.

48. As a result of Samsung's infringement of the '130 Patent, JOLED has suffered damages and will continue to suffer damages. JOLED has been and is in compliance with 35 U.S.C. § 287(a) because there is no obligation to mark products performing a method.

Moreover, JOLED has not made, offered for sale, or sold any articles patented under the '130 Patent within the United States, nor imported any articles patented under the '130 Patent into the United States. JOLED is not aware of any articles patented under the '130 Patent that have been made, offered for sale, or sold within the United States, or imported into the United States, by any person for or under JOLED.

49. Upon information and belief, Samsung's infringement of the '130 Patent has been and continues to be willful and deliberate. Samsung's pre-suit knowledge of the '130 Patent and pre-suit knowledge that Samsung's actions and Samsung's customers' actions constitute infringement is sufficient to support a reasonable inference that Samsung knew, or should have known, that its subsequent actions posed an objective risk of infringement.

#### **COUNT II – INFRINGEMENT OF THE '597 PATENT**

50. JOLED hereby restates and re-alleges the allegations set forth in paragraphs 1 – 49 above and incorporates them by reference.

51. The Defendants have been and are now directly infringing and/or inducing each other and Samsung's customers to infringe the '597 Patent in this District and elsewhere in violation of 35 U.S.C. § 271 at least by using, selling, and/or offering to sell within the United States, and/or importing into the United States, Accused Products that practice at least claim 1 of the '597 Patent.

52. Samsung has committed infringing acts without the permission, consent, authorization, or license of JOLED.

53. Samsung's infringement is literal, under the doctrine of equivalents, or both.

54. Samsung infringes at least claim 1 of the '597 Patent as set forth below.

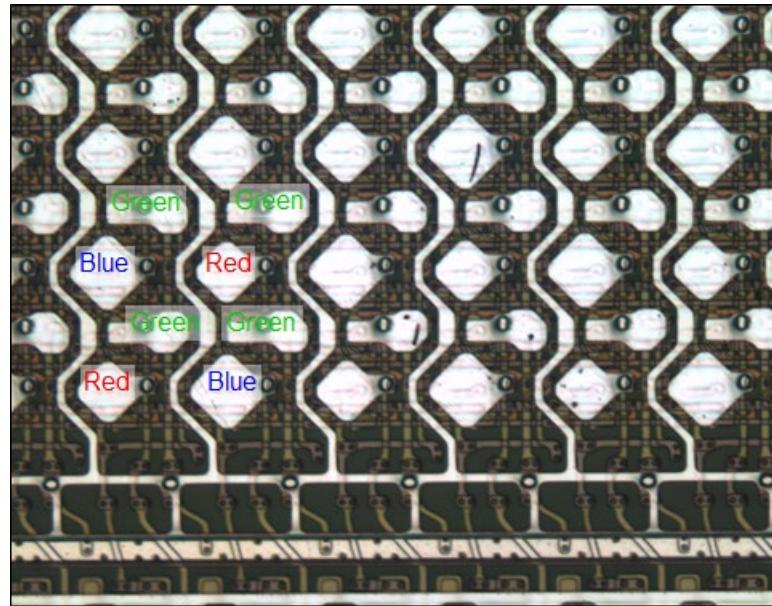
55. Independent claim 1 of the '597 Patent recites:

An electroluminescent (EL) display apparatus comprising:

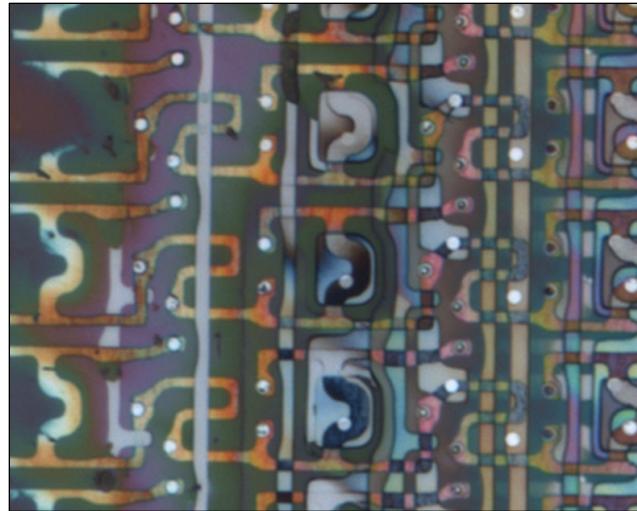
- a display screen including pixels arranged in a matrix, each of the pixels including an EL device and a pixel circuit;
- a source signal line through which an analog image signal output from a source driver circuit is transmitted; and
- a gate driver circuit which includes a first gate driver circuit and a second gate driver circuit, first gate signal lines through which selection voltages and non-selection voltages output from the first gate driver circuit are transmitted, and second gate signal lines through which selection voltages and non-selection voltages output from the second gate driver circuit are transmitted, wherein the pixel circuit of each of the pixels includes:
  - a driving transistor to supply a current to the EL device;
  - a first switch transistor provided on a current path through which the current is supplied by the driving transistor to the EL device;
  - a second switch transistor to supply, to the driving transistor, the analog image signal supplied from the source signal line; and
  - a third switch transistor for initially resetting the pixel circuit before the second switch transistor supplies, to the driving transistor, the analog image signal supplied from the source signal line, a gate terminal of the first switch transistor is connected to the first gate driver circuit, a gate terminal of the second switch transistor and a gate terminal of the third switch transistor are connected to the second gate driver circuit, the second gate driver circuit includes a second gate signal line connected to both the gate terminal of the second switch transistor of a Nth row and the gate

terminal of the third switch transistor of a (N+1)th row for simultaneously connecting the gate terminal of the second switch transistor of the Nth row and the gate terminal of the third switch transistor of the (N+1)th row, the third switch transistor initially resets a gate terminal of the driving transistor by shorting the gate terminal of the driving transistor and an initial reset voltage line, and the first switch transistor of the (N+1)th row is controlled in an OFF state by the first gate driver circuit when the third switch transistor initially resets the gate terminal of the driving transistor.

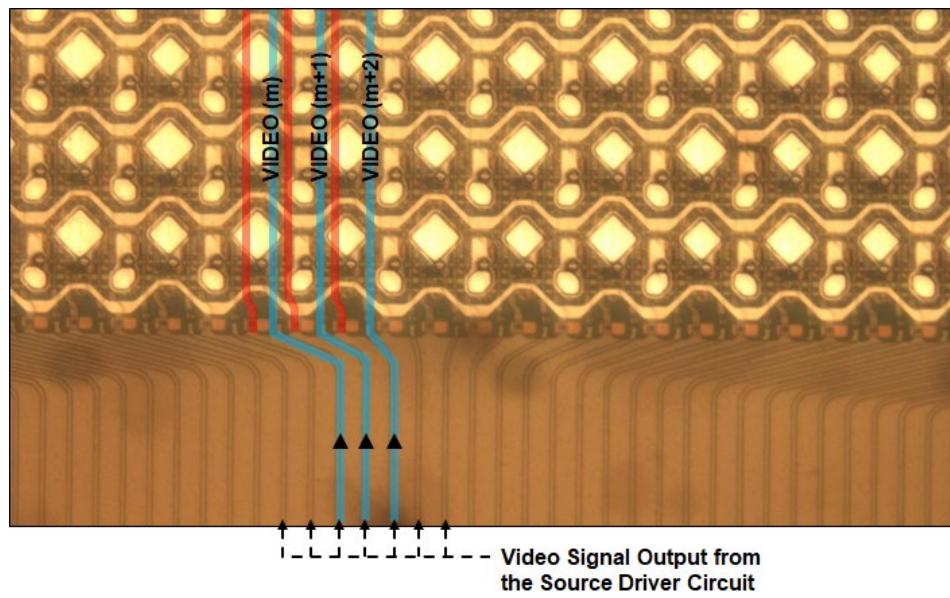
56. The Accused Products, including Samsung Galaxy smartphones, include an EL display apparatus comprising: a display screen that includes pixels arranged in a matrix, each of the pixels including an EL device and a pixel circuit. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a display screen that includes pixels arranged in a matrix:



57. For example, as shown in the photograph below, in the Samsung Galaxy smartphones, each of the pixels includes an EL device and a pixel circuit:

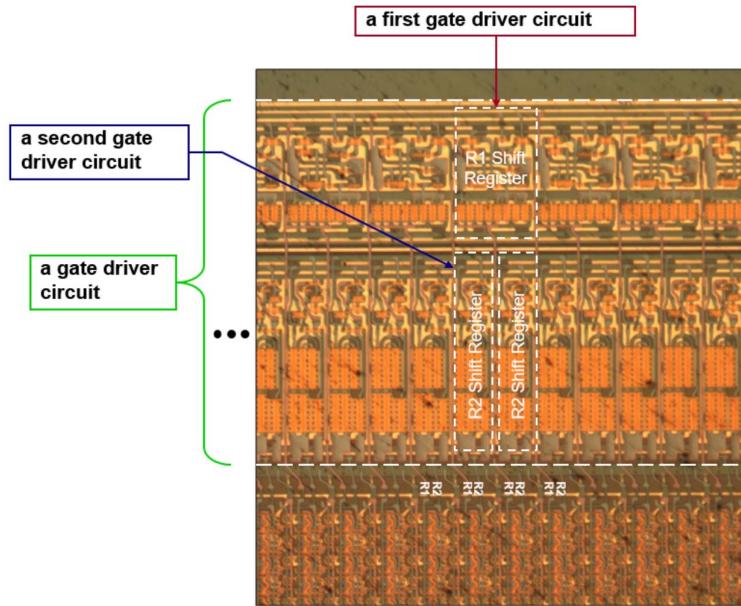


58. The Accused Products, including Samsung Galaxy smartphones, include a source signal line through which an analog image signal output from a source driver circuit is transmitted. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a source signal line through which an analog image signal output from a source driver circuit is transmitted:

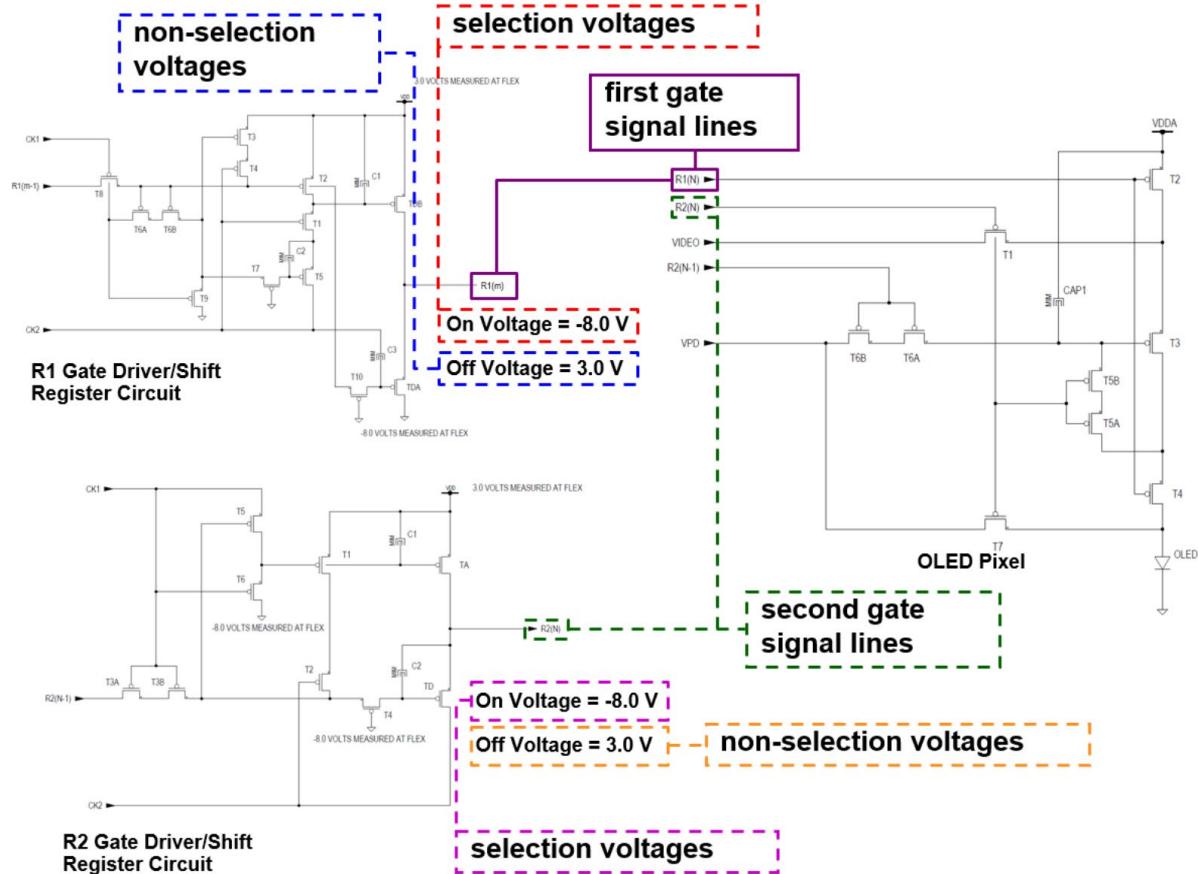


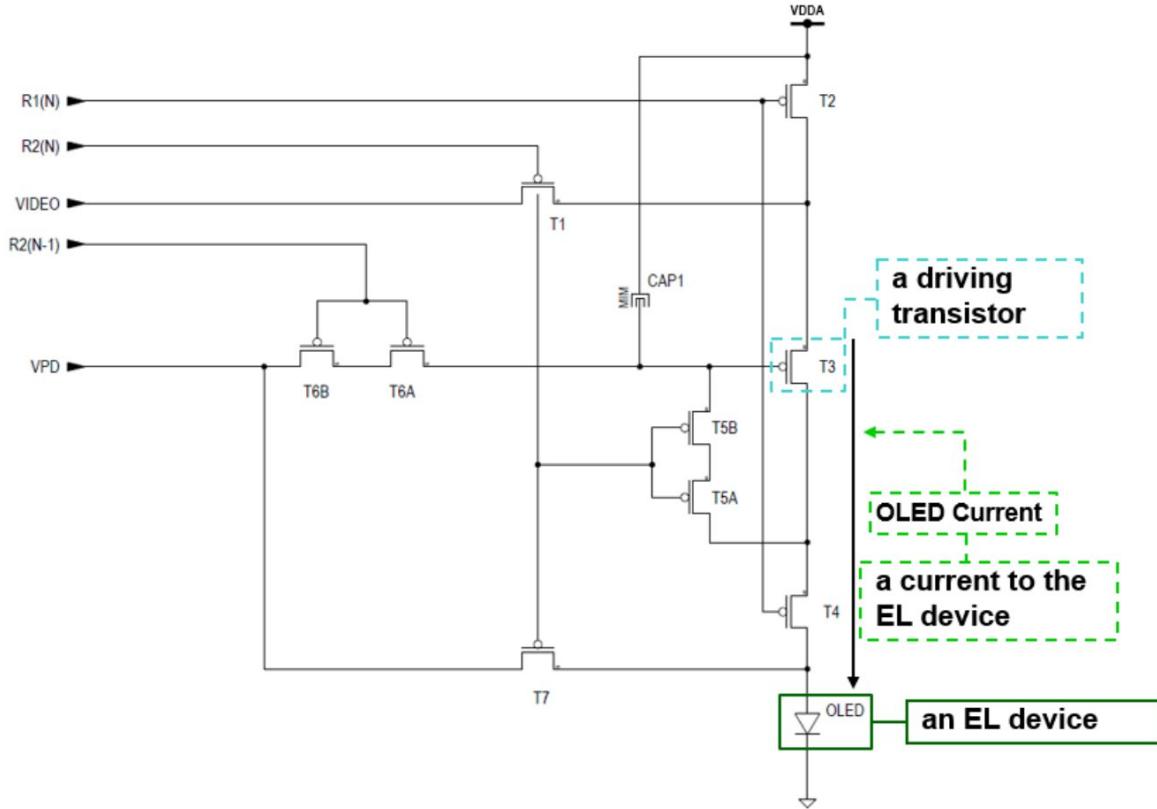
59. The Accused Products, including Samsung Galaxy smartphones, include a gate driver circuit which includes a first gate driver circuit and a second gate driver circuit, first gate

signal lines through which selection voltages and non-selection voltages output from the first gate driver circuit are transmitted, and second gate signal lines through which selection voltages and non-selection voltages output from the second gate driver circuit are transmitted. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a gate driver circuit which includes a first gate driver circuit and a second gate driver circuit:



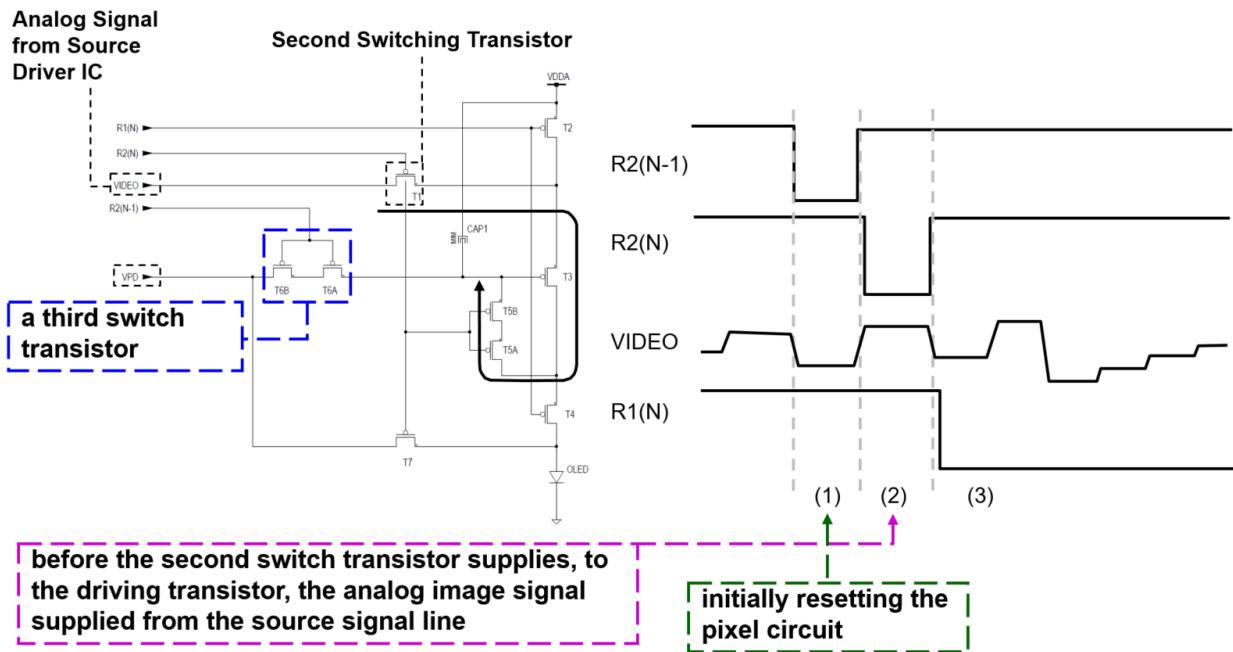
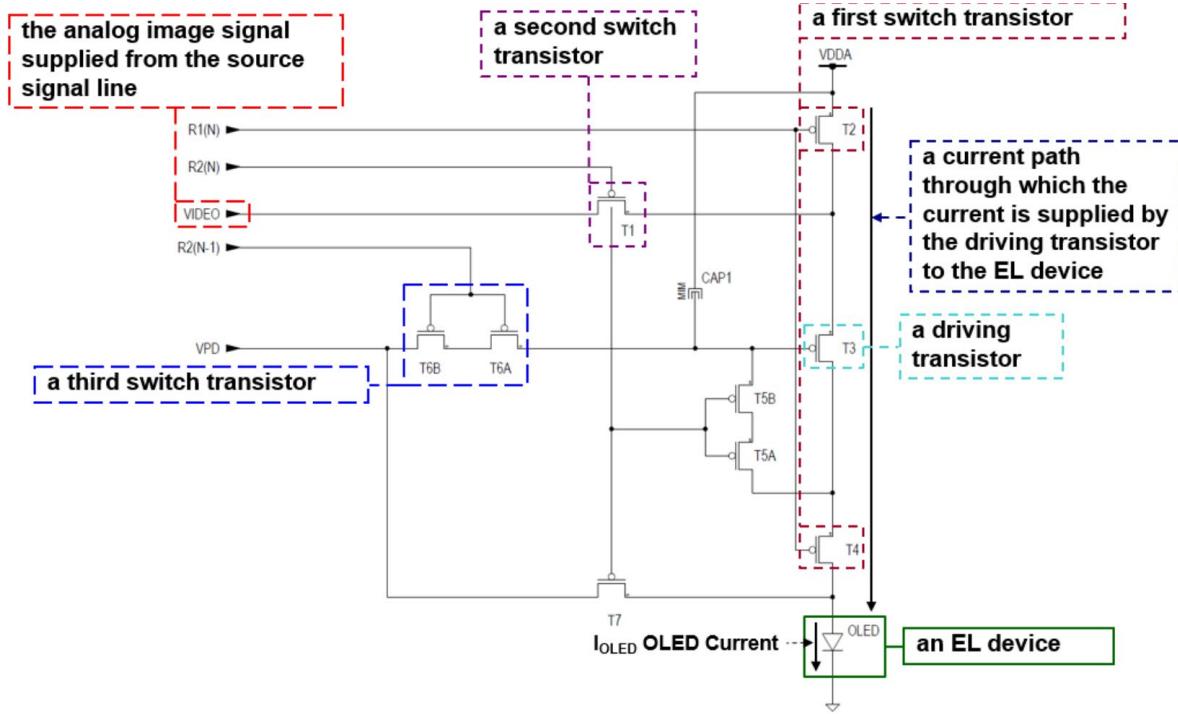
For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones include first gate signal lines through which selection voltages and non-selection voltages output from the first gate driver circuit are transmitted, and second gate signal lines through which selection voltages and non-selection voltages output from the second gate driver circuit are transmitted:



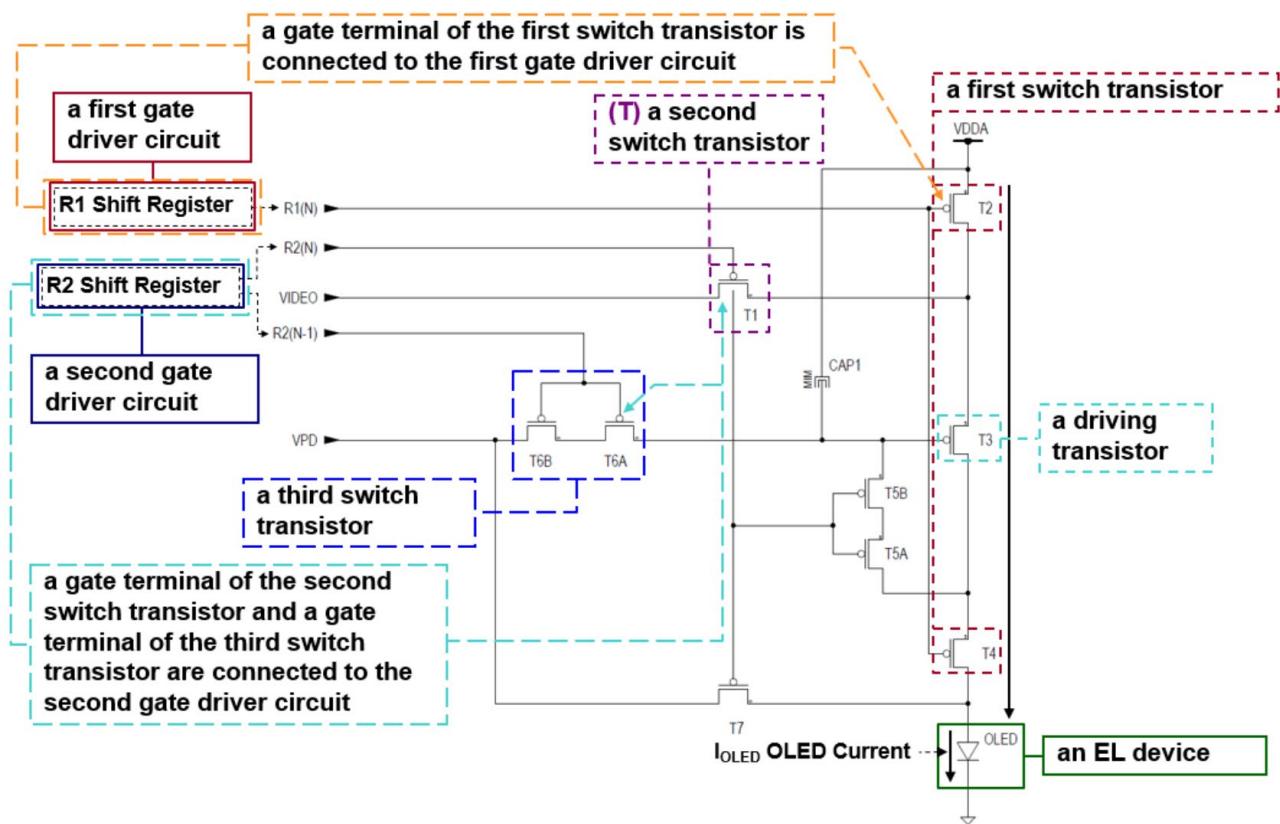


61. In the Accused Products, including Samsung Galaxy smartphones, the pixel circuit of each of the pixels includes: a first switch transistor provided on a current path through which the current is supplied by the driving transistor to the EL device; a second switch transistor to supply, to the driving transistor, the analog image signal supplied from the source signal line; and a third switch transistor for initially resetting the pixel circuit before the second switch transistor supplies, to the driving transistor, the analog image signal supplied from the source signal line. For example, as shown in the annotated circuit diagrams below, in the Samsung Galaxy smartphones, the pixel circuit of each of the pixels includes: a first switch transistor provided on a current path through which the current is supplied by the driving transistor to the EL device; a second switch transistor to supply, to the driving transistor, the analog image signal supplied from the source signal line; and a third switch transistor for initially resetting the pixel circuit before the

second switch transistor supplies, to the driving transistor, the analog image signal supplied from the source signal line:

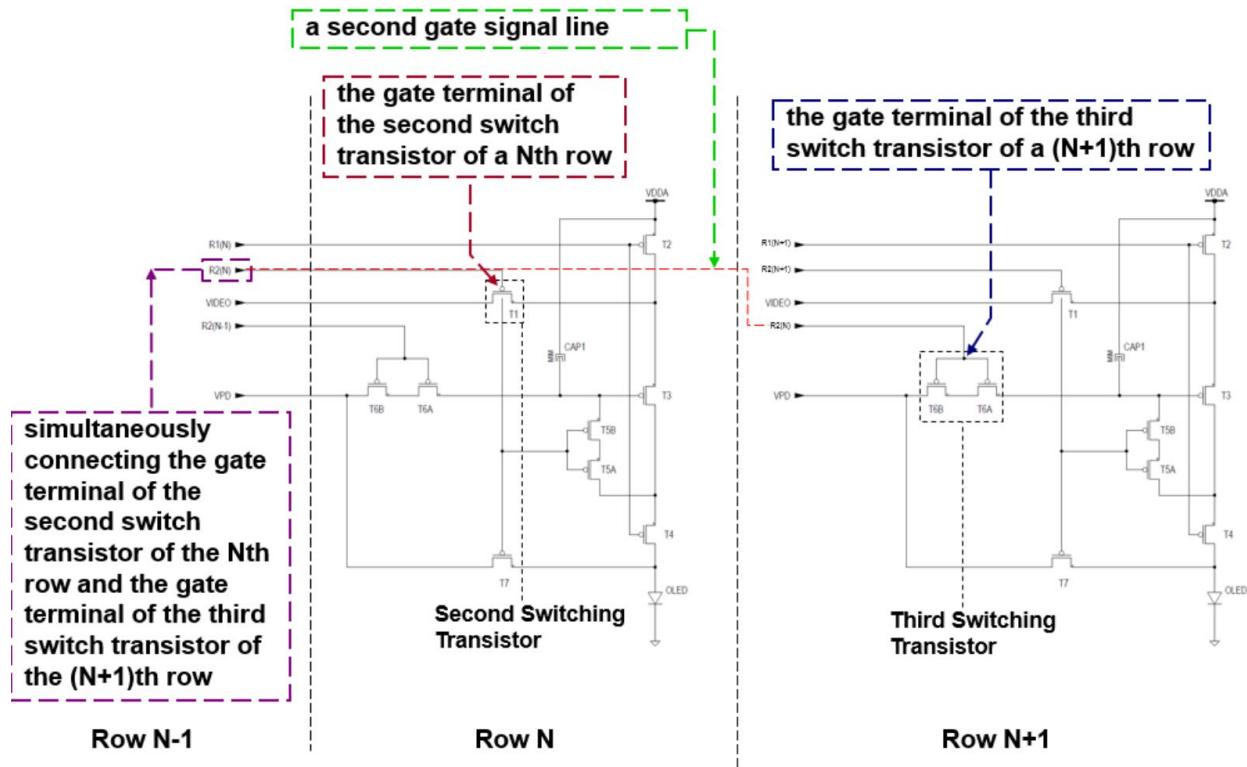


62. The Accused Products, including Samsung Galaxy smartphones, include a gate terminal of the first switch transistor connected to the first gate driver circuit, and a gate terminal of the second switch transistor and a gate terminal of the third switch transistor connected to the second gate driver circuit. For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones include a gate terminal of the first switch transistor connected to the first gate driver circuit, and a gate terminal of the second switch transistor and a gate terminal of the third switch transistor connected to the second gate driver circuit:

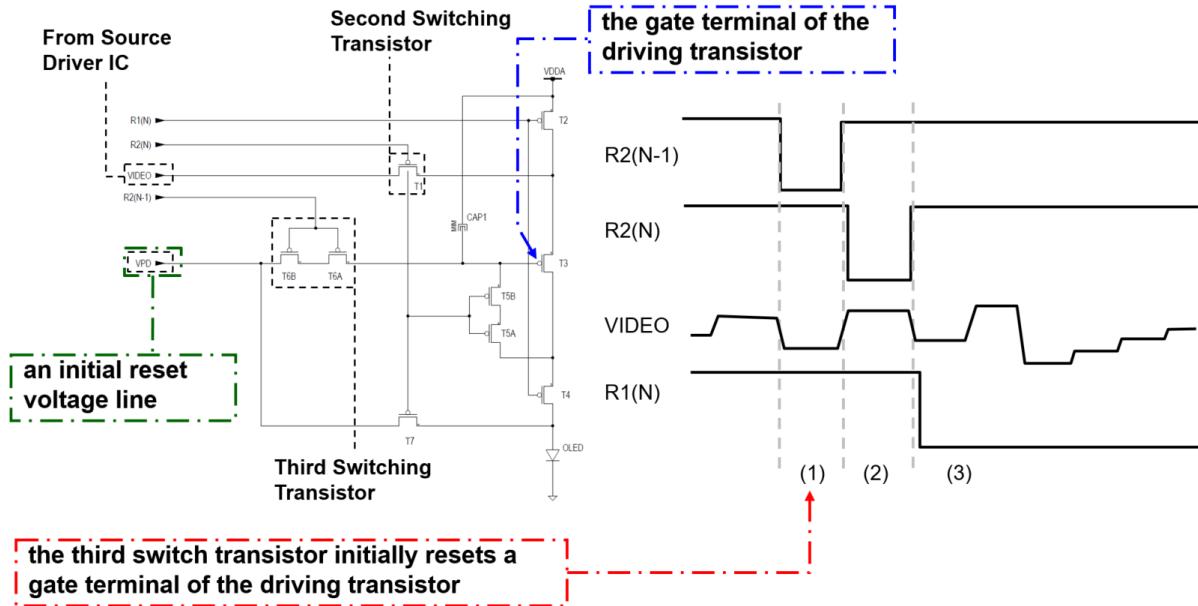


63. In the Accused Products, including Samsung Galaxy smartphones, the second gate driver circuit includes a second gate signal line connected to both the gate terminal of the second switch transistor of a Nth row and the gate terminal of the third switch transistor of a (N+1)th row for simultaneously connecting the gate terminal of the second switch transistor of the Nth row and the gate terminal of the third switch transistor of the (N+1)th row. For example, as shown in the

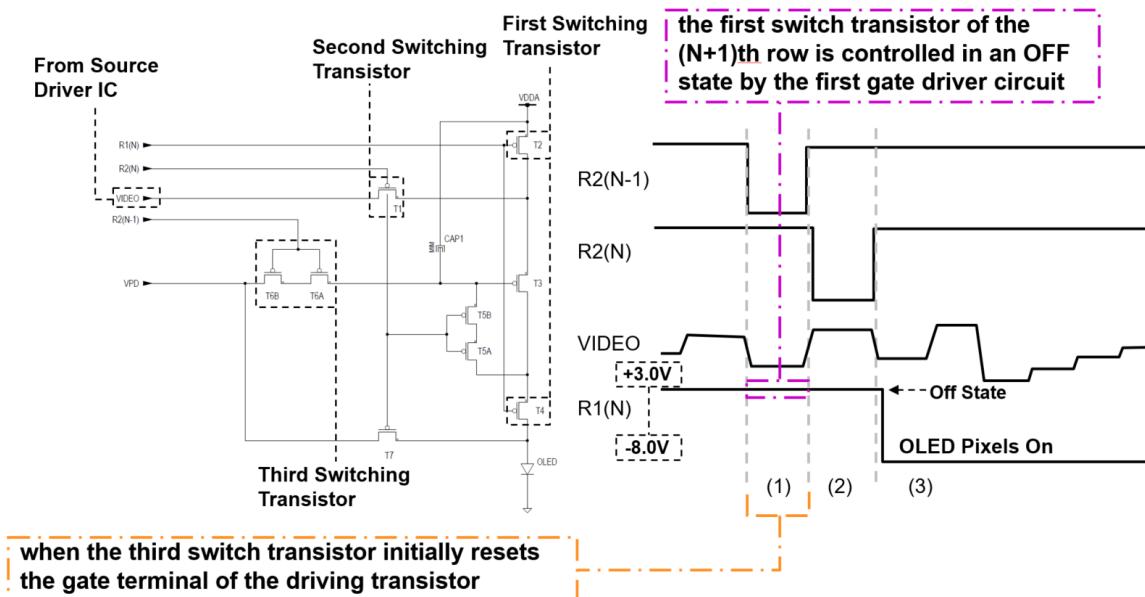
annotated circuit diagram below, in the Samsung Galaxy smartphones, the second gate driver circuit includes a second gate signal line connected to both the gate terminal of the second switch transistor of a Nth row and the gate terminal of the third switch transistor of a (N+1)th row for simultaneously connecting the gate terminal of the second switch transistor of the Nth row and the gate terminal of the third switch transistor of the (N+1)th row:



64. In the Accused Products, including Samsung Galaxy smartphones, the third switch transistor initially resets a gate terminal of the driving transistor by shorting the gate terminal of the driving transistor and an initial reset voltage line. For example, as shown in the annotated circuit diagram below, in the Samsung Galaxy smartphones, the third switch transistor initially resets a gate terminal of the driving transistor by shorting the gate terminal of the driving transistor and an initial reset voltage line:



65. In the Accused Products, including Samsung Galaxy smartphones, the first switch transistor of the  $(N+1)$ th row is controlled in an OFF state by the first gate driver circuit when the third switch transistor initially resets the gate terminal of the driving transistor. For example, as shown in the annotated circuit diagram below, in the Samsung Galaxy smartphones, the first switch transistor of the  $(N+1)$ th row is controlled in an OFF state by the first gate driver circuit when the third switch transistor initially resets the gate terminal of the driving transistor:



66. Upon information and belief, Samsung has been and is currently actively inducing and encouraging infringement of the '597 Patent. Samsung actively encourages its customers to infringe at least claim 1 of the '597 Patent by supplying Accused Products and by encouraging the use of such Accused Products in a manner (e.g., operating the OLED displays) that would necessarily lead to infringement of at least claim 1 of the '597 Patent. These facts give rise to a reasonable inference that Samsung knowingly induces its customers to infringe at least claim 1 of the '597 Patent directly, and that Samsung possesses a specific intent to cause such direct infringement. Samsung has been aware of the '597 Patent and of Samsung's infringement and Samsung's customers' infringement of the '597 Patent, since at least on or about May 15, 2020, when JOLED's counsel sent Samsung a letter attaching a copy of the '597 Patent and demanding that Samsung abate such infringement by taking a license or otherwise.

67. Upon information and belief, Samsung had knowledge of the '597 Patent before JOLED's counsel sent this letter to Samsung.

68. Samsung induces its customers to infringe by instructing its customers to turn on and/or operate the OLED display in the Accused Products. For example, Samsung provides a user manual for the Samsung Galaxy S9+ at [https://images.samsung.com/is/content/samsung/p5/ca/support/mobile-devices/galaxy-s9-plus-how-do-i-access-the-user-manual-on-my-samsung-galaxy-s9-plus/pdf/SM-G96X\\_UG\\_EN4.pdf](https://images.samsung.com/is/content/samsung/p5/ca/support/mobile-devices/galaxy-s9-plus-how-do-i-access-the-user-manual-on-my-samsung-galaxy-s9-plus/pdf/SM-G96X_UG_EN4.pdf). The user manual specifically instructs Samsung's customers to turn on the screen using the Home button to activate the "Always on Display."

69. Upon information and belief, Samsung has committed and continues to commit all of the above acts of infringement despite Samsung's lack of a good-faith belief that at least claim 1 of the '597 Patent is not infringed, invalid, or unenforceable.

70. As a result of Samsung's infringement of the '597 Patent, JOLED has suffered damages and will continue to suffer damages. JOLED has been in compliance with 35 U.S.C. § 287(a) since at least on or about May 15, 2020. Moreover, JOLED has not made, offered for sale, or sold any articles patented under the '597 Patent within the United States, nor imported any articles patented under the '597 Patent into the United States. JOLED is not aware of any articles patented under the '597 Patent that have been made, offered for sale, or sold within the United States, or imported into the United States, by any person for or under JOLED.

71. Upon information and belief, Samsung's infringement of the '597 Patent has been and continues to be willful and deliberate. Samsung's pre-suit knowledge of the '597 Patent and pre-suit knowledge that Samsung's actions and the actions of Samsung's customers constitute infringement is sufficient to support a reasonable inference that Samsung knew, or should have known, that its subsequent actions posed an objective risk of infringement.

### **COUNT III – INFRINGEMENT OF THE METHOD CLAIMS OF THE '108 PATENT**

72. JOLED hereby restates and re-alleges the allegations set forth in paragraphs 1 – 71 above and incorporates them by reference.

73. The Defendants have been and are now directly infringing, and/or inducing each other and Samsung's customers to infringe the '108 Patent in this District and elsewhere in violation of 35 U.S.C. § 271 at least by using, selling, and/or offering to sell within the United States, and/or importing into the United States, Accused Products that practice the method claims of the '108 Patent, including at least claim 16.

74. Samsung has committed infringing acts without the permission, consent, authorization, or license of JOLED.

75. Samsung's infringement is literal, under the doctrine of equivalents, or both.

76. Upon information and belief, Samsung has directly infringed and continues to infringe directly at least claim 16 of the method claims of the '108 Patent through actions such as testing and demonstrations of the Accused Products in the United States.

77. In addition to its own direct infringement, upon information and belief, Samsung has been and is currently actively inducing and encouraging infringement of at least claim 16 of the method claims of the '108 Patent. Samsung's customers have infringed, and continue to infringe, at least claim 16 of the method claims of the '108 Patent through their use of the Accused Products. Samsung has been aware of the '108 Patent and of Samsung's infringement and Samsung's customers' infringement of the '108 Patent, since at least on or about May 15, 2020, when JOLED's counsel sent Samsung a letter attaching a copy of the '108 Patent and demanding that Samsung abate such infringement by taking a license or otherwise.

78. Upon information and belief, Samsung had knowledge of the '108 Patent before JOLED's counsel sent this letter to Samsung.

79. Samsung actively encourages its customers to infringe at least claim 16 of the method claims of the '108 Patent by supplying Accused Products and by encouraging the use of such Accused Products in a manner (e.g., turning on and/or operating OLED displays) that would necessarily lead to the performance of the method steps described below. For example, Samsung's customers in the United States in accordance with Samsung's instructions contained in its user manuals, perform the claimed method and thereby directly infringe at least claim 16 of the method claims of the '108 Patent reciting such method. These facts give rise to a reasonable inference that Samsung knowingly induces its customers to infringe at least claim 16 of the method claims of the '108 Patent directly, and that Samsung possesses a specific intent to cause such direct infringement.

80. Samsung and its customers infringe at least claim 16 of the method claims of the '108 Patent as set forth below.

81. Independent claim 16 of the '108 Patent recites:

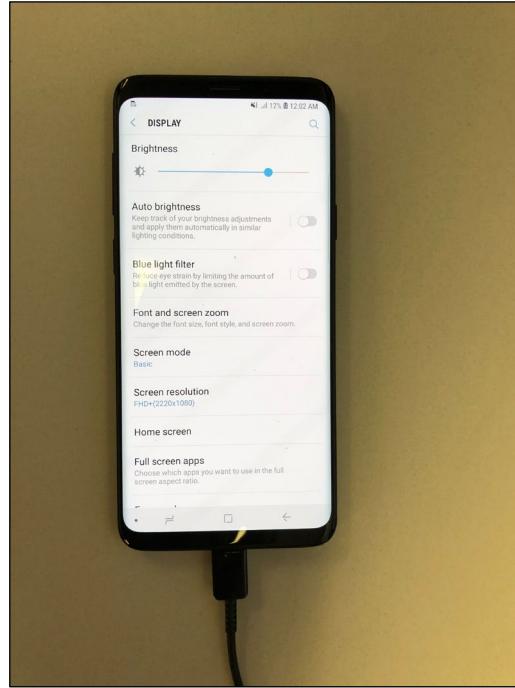
A method of controlling an electroluminescent (EL) display apparatus, the EL display apparatus comprising:

- a display screen including pixels arranged in a matrix, each of the pixels including an EL device and a pixel circuit;
- a source signal line through which an analog image signal output from a source driver circuit is transmitted; and
- a gate driver circuit which includes a first gate driver circuit and a second gate driver circuit, first gate signal lines through which selection voltages and non-selection voltages output from the first gate driver circuit are transmitted, and second gate signal lines through which selection voltages and non-selection voltages output from the second gate driver circuit are transmitted, the pixel circuit of each of the pixels including:
  - a driving transistor to supply a current to the EL device;
  - a first switch transistor provided on a current path through which the current flows from a power line through the driving transistor to the EL device;
  - a second switch transistor to supply, to the driving transistor, the analog image signal supplied from the source signal line; and
  - a third switch transistor for initially resetting the pixel circuit before the second switch transistor supplies, to the driving transistor, the analog image signal supplied from the source signal line, a gate terminal of the first switch transistor is connected

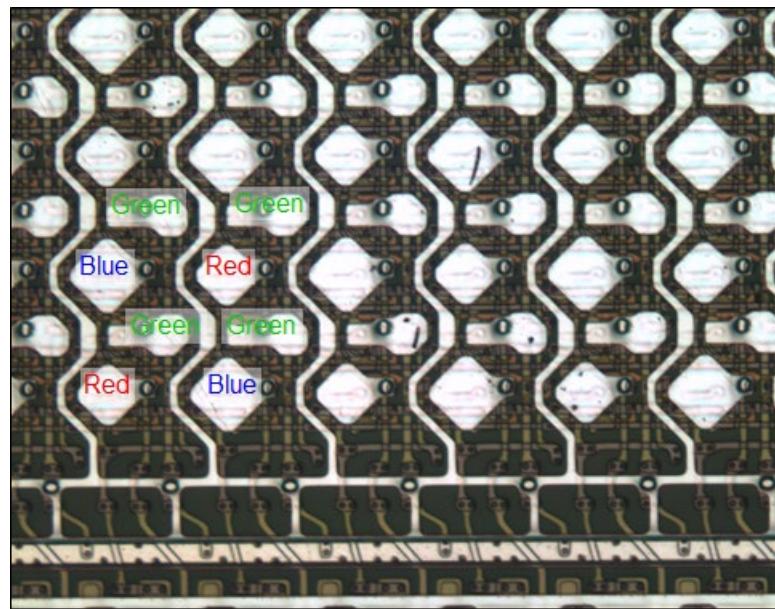
to the first gate driver circuit, a gate terminal of the second switch transistor and a gate terminal of the third switch transistor are connected to the second gate driver circuit, the second gate driver circuit includes a second gate signal line connected to both the gate terminal of the second switch transistor of a  $N$ th pixel row and the gate terminal of the third switch transistor of a  $(N+1)$ th pixel row for simultaneously connecting the gate terminal of the second switch transistor of the  $N$ th pixel row and the gate terminal of the third switch transistor of the  $(N+1)$ th pixel row, the method comprising:

- programming, by the second gate driver circuit and during a period, a first pixel of the  $N$ th pixel row with a voltage by applying an on-voltage to the second gate signal line to turn on the second switch transistor of the first pixel;
- resetting, by the second gate driver circuit and during the period, a second pixel of the  $(N+1)$ th pixel row by applying the on-voltage to the second gate signal line to simultaneously turn on the third switch transistor of the second pixel; and
- controlling the first switch transistor of the  $(N+1)$ th pixel row in an OFF state by the first gate driver circuit when the third switch transistor initially resets the pixel circuit.

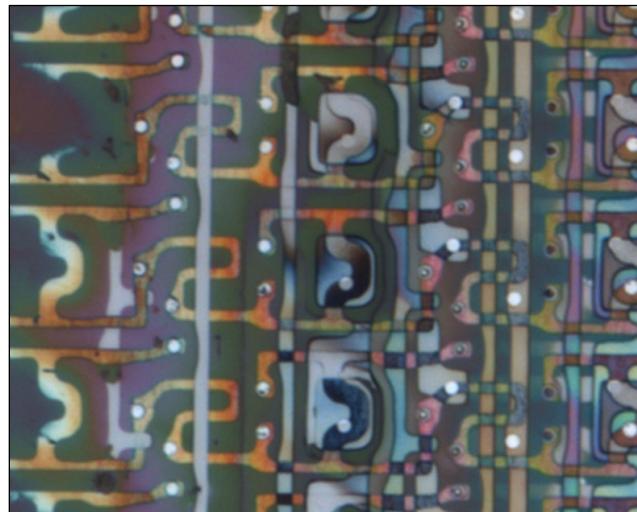
82. Samsung and its customers have performed and currently perform a method of controlling an EL display apparatus through their use of the Accused Products, including Samsung Galaxy smartphones, in the United States. For example, as shown in the photograph below, Samsung Galaxy smartphones include a controllable EL display apparatus:



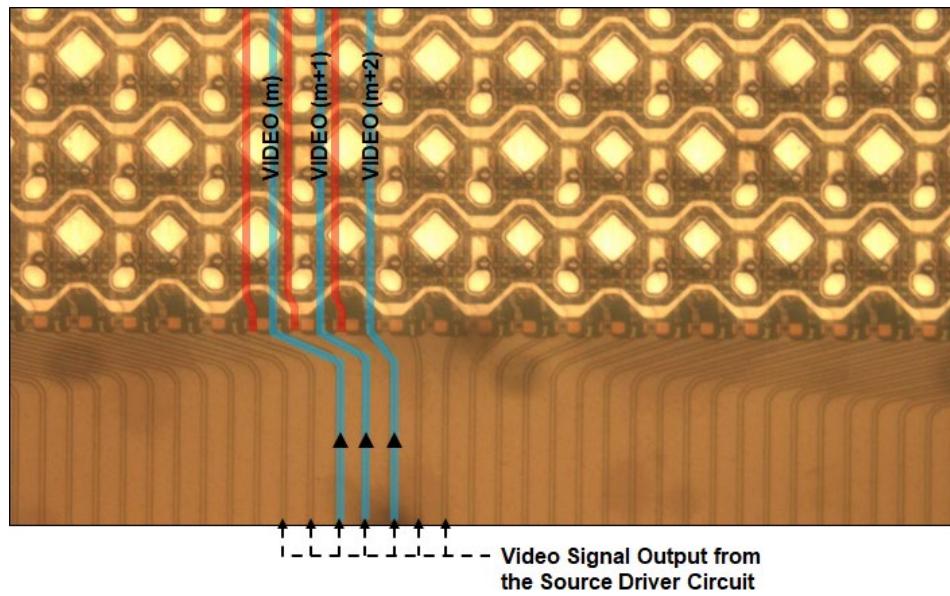
83. The Accused Products, including Samsung Galaxy smartphones, include an EL display apparatus comprising: a display screen that includes pixels arranged in a matrix, each of the pixels including an EL device and a pixel circuit. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a display screen that includes pixels arranged in a matrix:



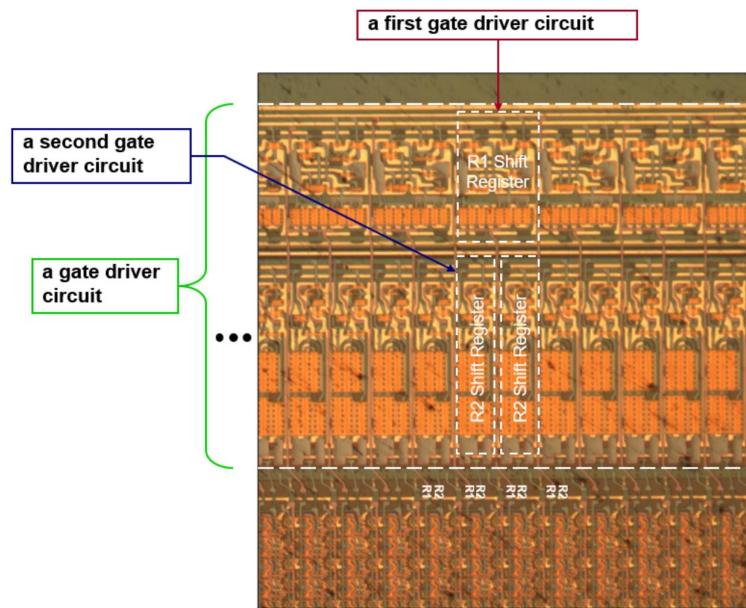
84. For example, as shown in the photograph below, in the Samsung Galaxy smartphones, each of the pixels includes an EL device and a pixel circuit:



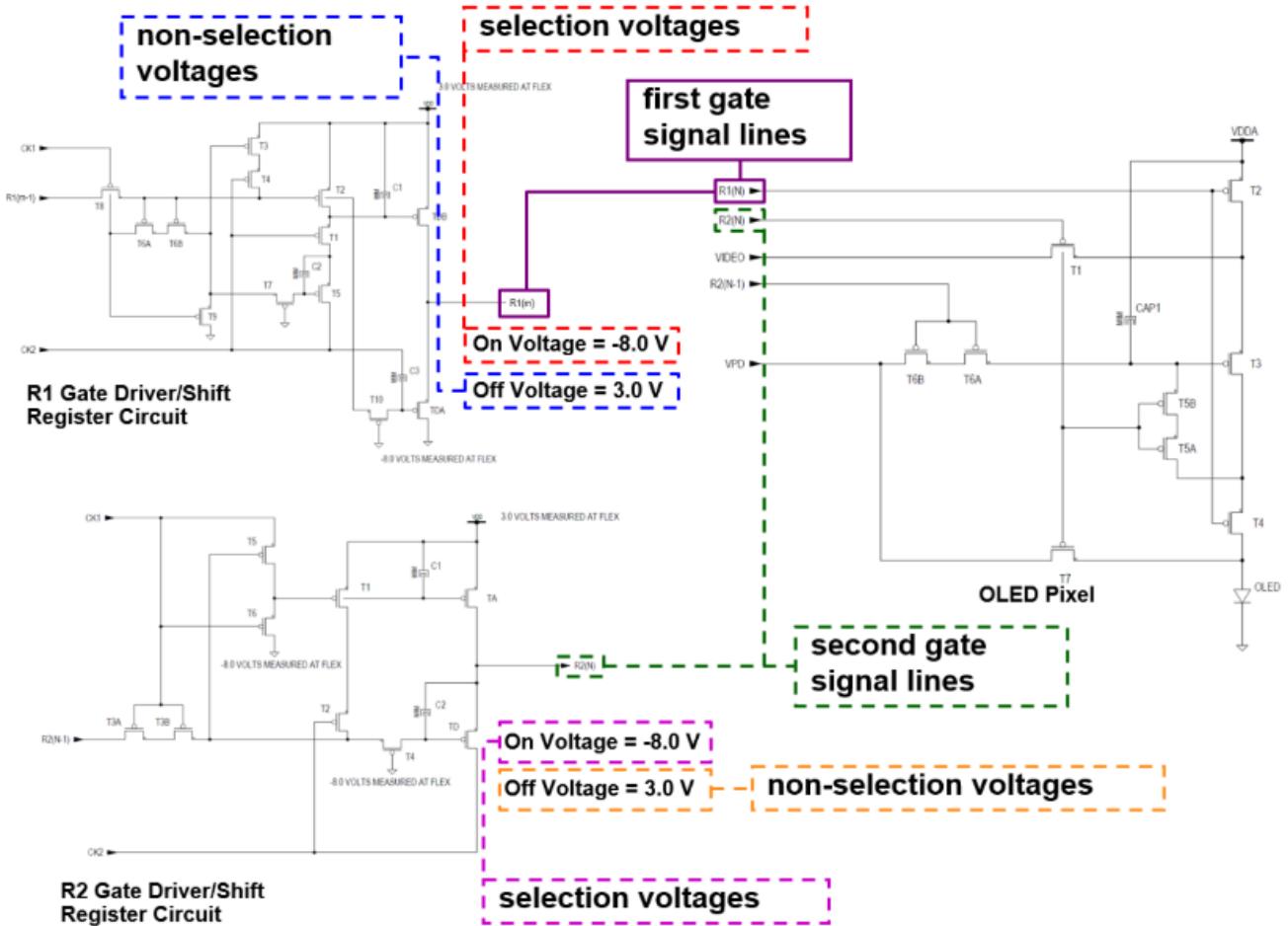
85. The Accused Products, including Samsung Galaxy smartphones, include a source signal line through which an analog image signal output from a source driver circuit is transmitted. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a source signal line through which an analog image signal output from a source driver circuit is transmitted:



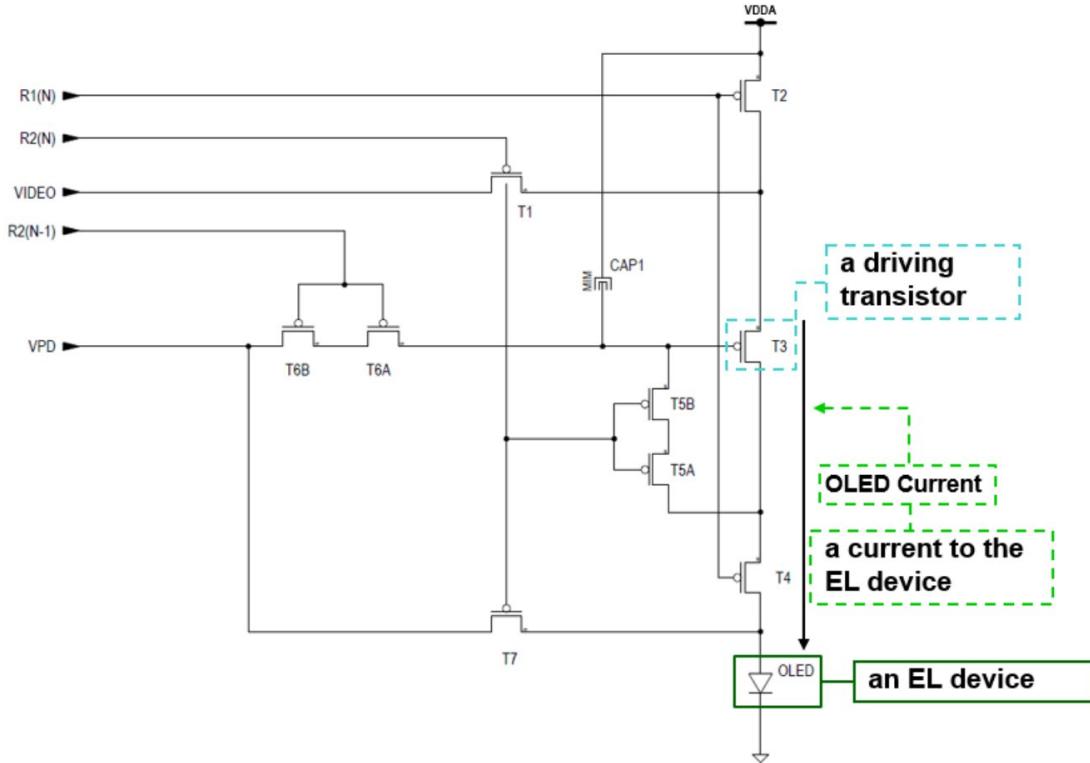
86. The Accused Products, including Samsung Galaxy smartphones, include a gate driver circuit which includes a first gate driver circuit and a second gate driver circuit, first gate signal lines through which selection voltages and non-selection voltages output from the first gate driver circuit are transmitted, and second gate signal lines through which selection voltages and non-selection voltages output from the second gate driver circuit are transmitted. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a gate driver circuit which includes a first gate driver circuit and a second gate driver circuit:



For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones include first gate signal lines through which selection voltages and non-selection voltages output from the first gate driver circuit are transmitted, and second gate signal lines through which selection voltages and non-selection voltages output from the second gate driver circuit are transmitted:

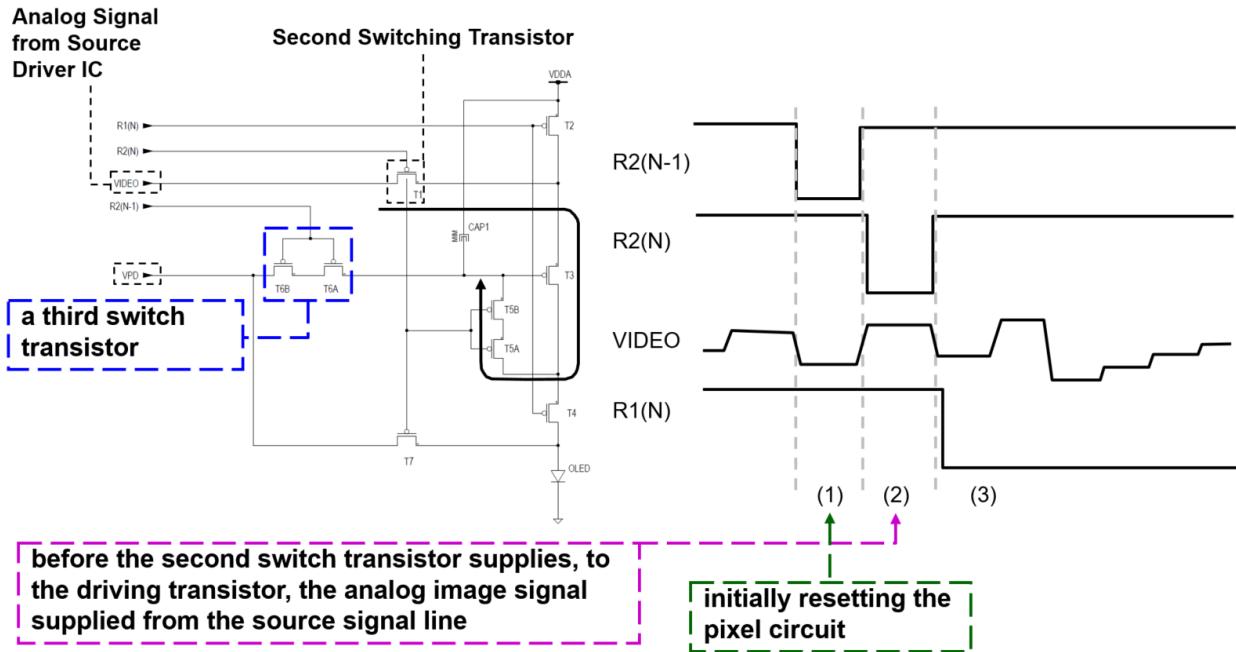
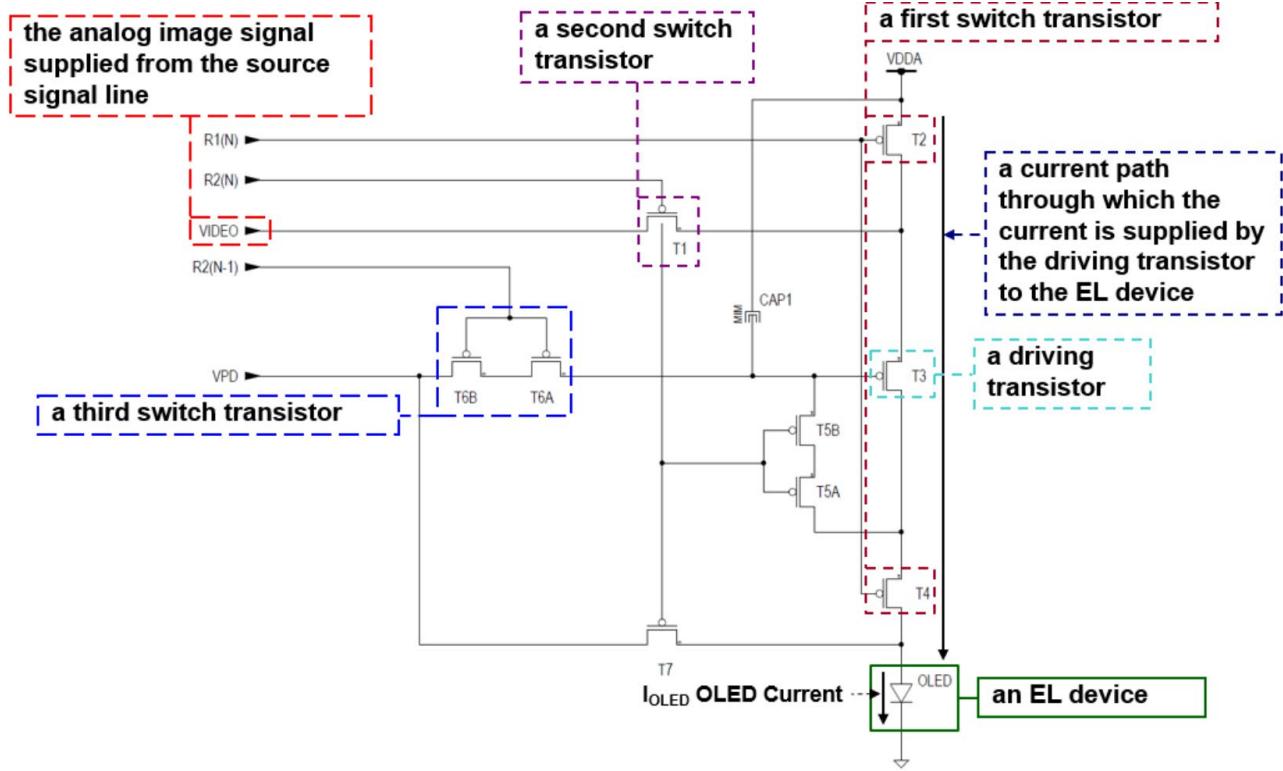


87. In the Accused Products, including Samsung Galaxy smartphones, the pixel circuit of each of the pixels includes a driving transistor to supply a current to the EL device. For example, as shown in the annotated circuit diagram below, in the Samsung Galaxy smartphones, the pixel circuit of each of the pixels includes a driving transistor to supply a current to the EL device:

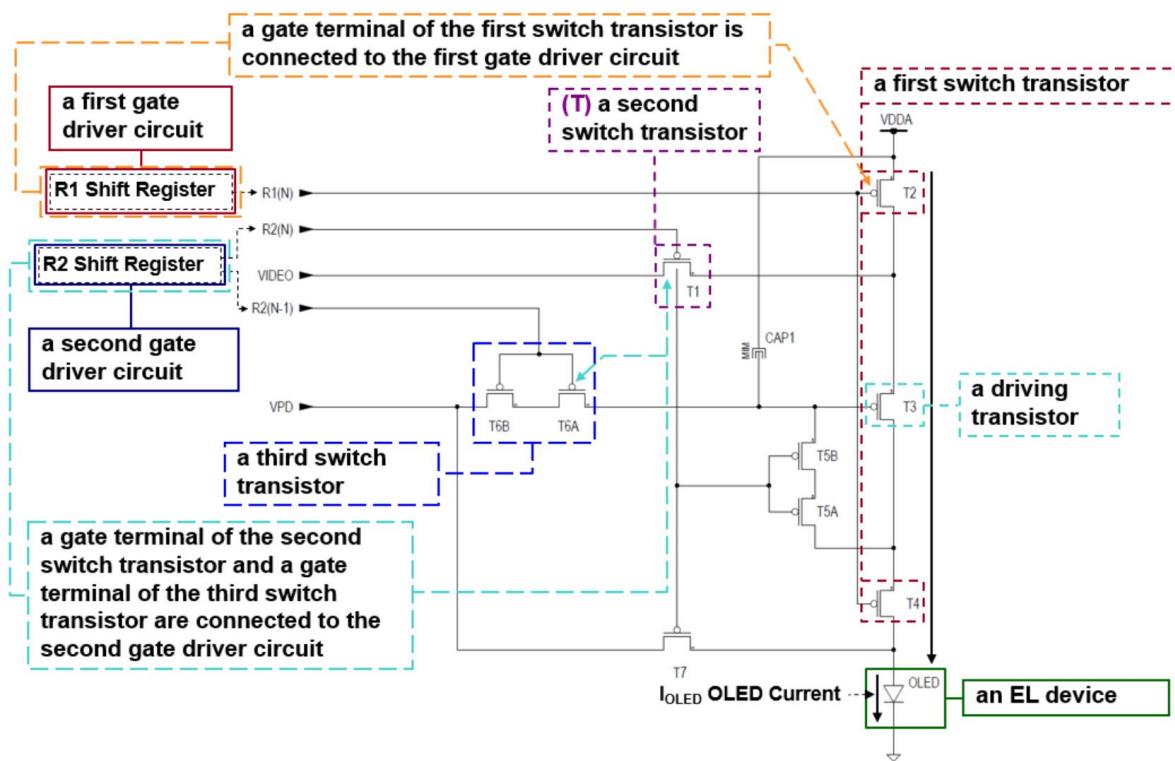


88. In the Accused Products, including Samsung Galaxy smartphones, the pixel circuit of each of the pixels includes: a first switch transistor provided on a current path through which the current is supplied by the driving transistor to the EL device; a second switch transistor to supply, to the driving transistor, the analog image signal supplied from the source signal line; and a third switch transistor for initially resetting the pixel circuit before the second switch transistor supplies, to the driving transistor, the analog image signal supplied from the source signal line. For example, as shown in the annotated circuit diagrams below, in the Samsung Galaxy smartphones, the pixel circuit of each of the pixels includes: a first switch transistor provided on a current path through which the current is supplied by the driving transistor to the EL device; a second switch transistor to supply, to the driving transistor, the analog image signal supplied from the source signal line; and a third switch transistor for initially resetting the pixel circuit before the

second switch transistor supplies, to the driving transistor, the analog image signal supplied from the source signal line:

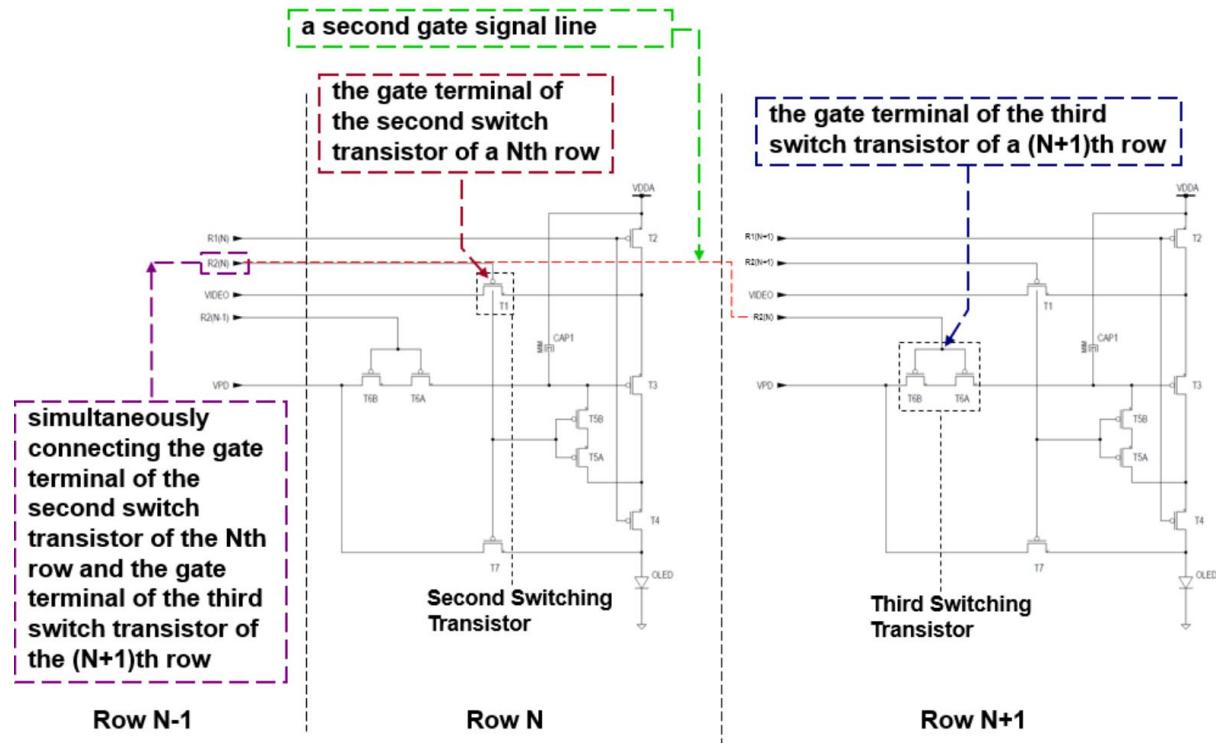


89. The Accused Products, including Samsung Galaxy smartphones, include a gate terminal of the first switch transistor connected to the first gate driver circuit, and a gate terminal of the second switch transistor and a gate terminal of the third switch transistor connected to the second gate driver circuit. For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones include a gate terminal of the first switch transistor connected to the first gate driver circuit, and a gate terminal of the second switch transistor and a gate terminal of the third switch transistor connected to the second gate driver circuit:



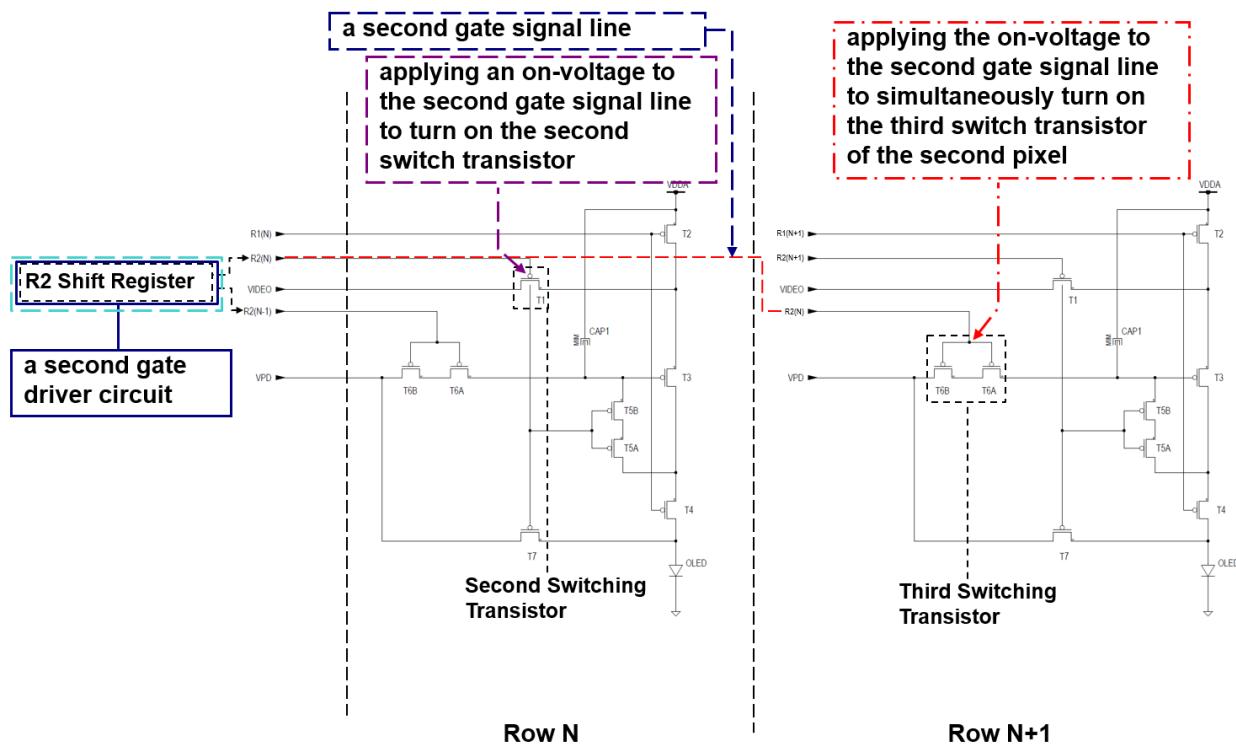
90. In the Accused Products, including Samsung Galaxy smartphones, the second gate driver circuit includes a second gate signal line connected to both the gate terminal of the second switch transistor of a  $N$ th pixel row and the gate terminal of the third switch transistor of a  $(N+1)$ th pixel row for simultaneously connecting the gate terminal of the second switch transistor of the  $N$ th pixel row and the gate terminal of the third switch transistor of the  $(N+1)$ th pixel row. For example, as shown in the annotated circuit diagram below, in the Samsung Galaxy smartphones,

the second gate driver circuit includes a second gate signal line connected to both the gate terminal of the second switch transistor of a Nth pixel row and the gate terminal of the third switch transistor of a (N+1)th pixel row for simultaneously connecting the gate terminal of the second switch transistor of the Nth pixel row and the gate terminal of the third switch transistor of the (N+1)th pixel row:



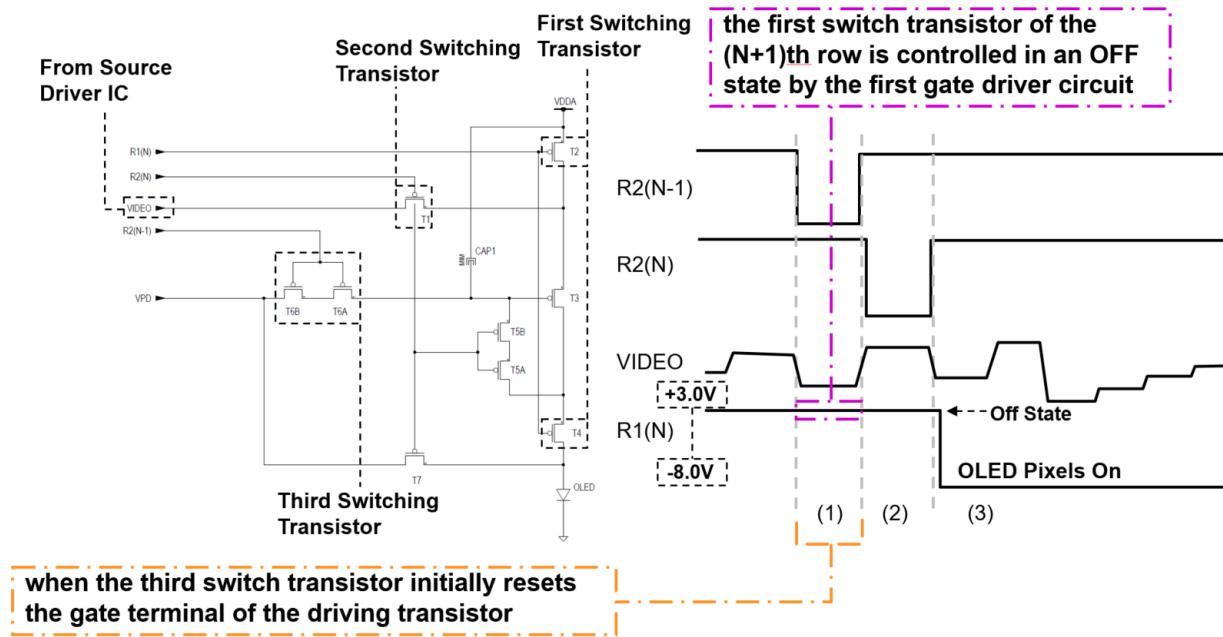
91. Samsung and its customers have used and currently use the Accused Products in the United States, including Samsung Galaxy smartphones, to perform a method comprising: programming, by the second gate driver circuit and during a period, a first pixel of the Nth pixel row with a voltage by applying an on-voltage to the second gate signal line to turn on the second switch transistor of the first pixel; and resetting, by the second gate driver circuit and during the period, a second pixel of the (N+1)th pixel row by applying the on-voltage to the second gate signal line to simultaneously turn on the third switch transistor of the second pixel. For example, as shown in the annotated circuit diagram below, the operation of the OLED display in the

Samsung Galaxy smartphones necessarily includes programming, by the second gate driver circuit and during a period, a first pixel of the Nth pixel row with a voltage by applying an on-voltage to the second gate signal line to turn on the second switch transistor of the first pixel; and resetting, by the second gate driver circuit and during the period, a second pixel of the (N+1)th pixel row by applying the on-voltage to the second gate signal line to simultaneously turn on the third switch transistor of the second pixel:



92. Samsung and its customers have used and currently use the Accused Products in the United States, including Samsung Galaxy smartphones, to perform a method comprising: controlling the first switch transistor of the (N+1)th pixel row in an OFF state by the first gate driver circuit when the third switch transistor initially resets the pixel circuit. For example, as shown in the annotated circuit diagram below, the operation of the OLED display in the Samsung Galaxy smartphones necessarily includes controlling the first switch transistor of the (N+1)th pixel

row in an OFF state by the first gate driver circuit when the third switch transistor initially resets the pixel circuit:



93. Samsung induces its customers to perform each of the method steps described above by instructing its customers to turn on and/or operate the OLED display in the Accused Products. For example, Samsung provides a user manual for the Samsung Galaxy S9+ at [https://images.samsung.com/is/content/samsung/p5/ca/support/mobile-devices/galaxy-s9-plus-how-do-i-access-the-user-manual-on-my-samsung-galaxy-s9-plus/pdf/SM-G96X\\_UG\\_EN4.pdf](https://images.samsung.com/is/content/samsung/p5/ca/support/mobile-devices/galaxy-s9-plus-how-do-i-access-the-user-manual-on-my-samsung-galaxy-s9-plus/pdf/SM-G96X_UG_EN4.pdf). The user manual specifically instructs Samsung's customers to turn on the screen using the Home button to activate the "Always on Display" as shown below:

### Turning on the screen using the Home button

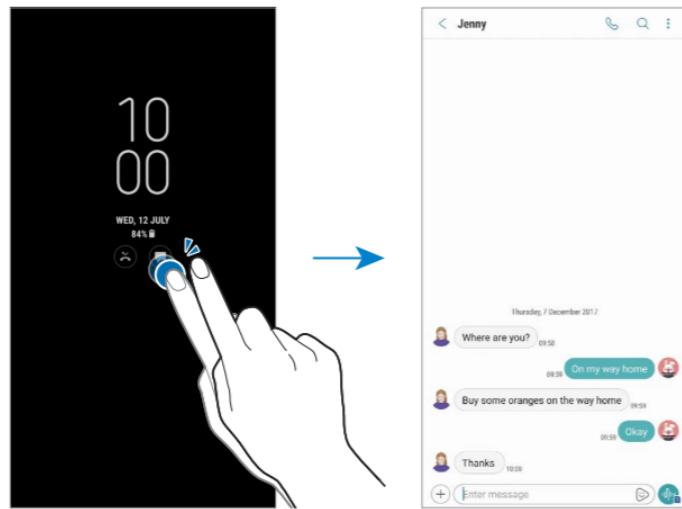
Hard press the Home button or the Home button area to turn on the screen.

On the Always On Display, you can also turn on the screen by double-tapping the Home button.



### Opening notifications on the Always On Display

When you receive message, missed call, or app notifications, notification icons will appear on the Always On Display. Double-tap a notification icon to view its notification.



94. Upon information and belief, Samsung has committed and continues to commit all of the above acts of infringement despite Samsung's lack of a good-faith belief that at least claim 16 of the method claims of the '108 Patent is not infringed, invalid, or unenforceable.

95. As a result of Samsung's infringement of the '108 Patent, JOLED has suffered damages and will continue to suffer damages. JOLED has been and is in compliance with 35 U.S.C. § 287(a) because there is no obligation to mark products performing a method.

Moreover, JOLED has not made, offered for sale, or sold any articles patented under the '108 Patent within the United States, nor imported any articles patented under the '108 Patent into the United States. JOLED is not aware of any articles patented under the '108 Patent that have been made, offered for sale, or sold within the United States, or imported into the United States, by any person for or under JOLED.

96. Upon information and belief, Samsung's infringement of the '108 Patent has been and continues to be willful and deliberate. Samsung's pre-suit knowledge of the '108 Patent and pre-suit knowledge that Samsung's actions and the actions of Samsung's customers constitute infringement is sufficient to support a reasonable inference that Samsung knew, or should have known, that its subsequent actions posed an objective risk of infringement.

#### **COUNT IV – INFRINGEMENT OF THE '336 PATENT**

97. JOLED hereby restates and re-alleges the allegations set forth in paragraphs 1 – 96 above and incorporates them by reference.

98. The Defendants have been and are now directly infringing and/or inducing each other and Samsung's customers to infringe the '336 Patent in this District and elsewhere in violation of 35 U.S.C. § 271 at least by using, selling, and/or offering to sell within the United States, and/or importing into the United States, Accused Products that practice at least claim 1 of the '336 Patent.

99. Samsung has committed infringing acts without the permission, consent, authorization, or license of JOLED.

100. Samsung's infringement is literal, under the doctrine of equivalents, or both.

101. Samsung infringes at least claim 1 of the '336 Patent as set forth below.

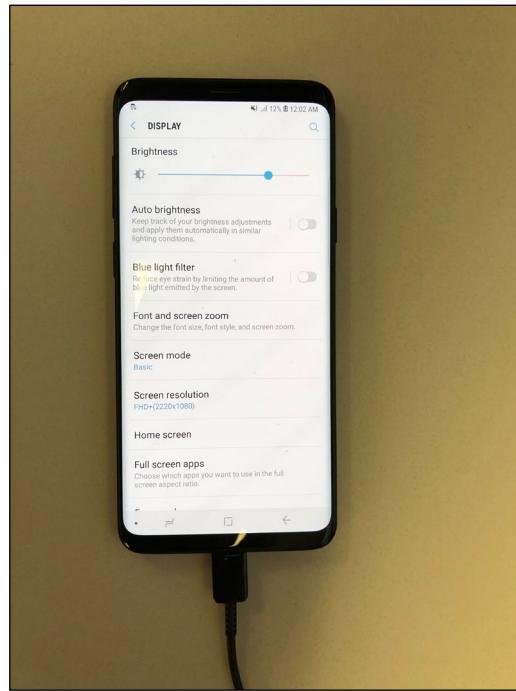
102. Independent claim 1 of the '336 Patent recites:

An electroluminescent (EL) display apparatus, comprising:

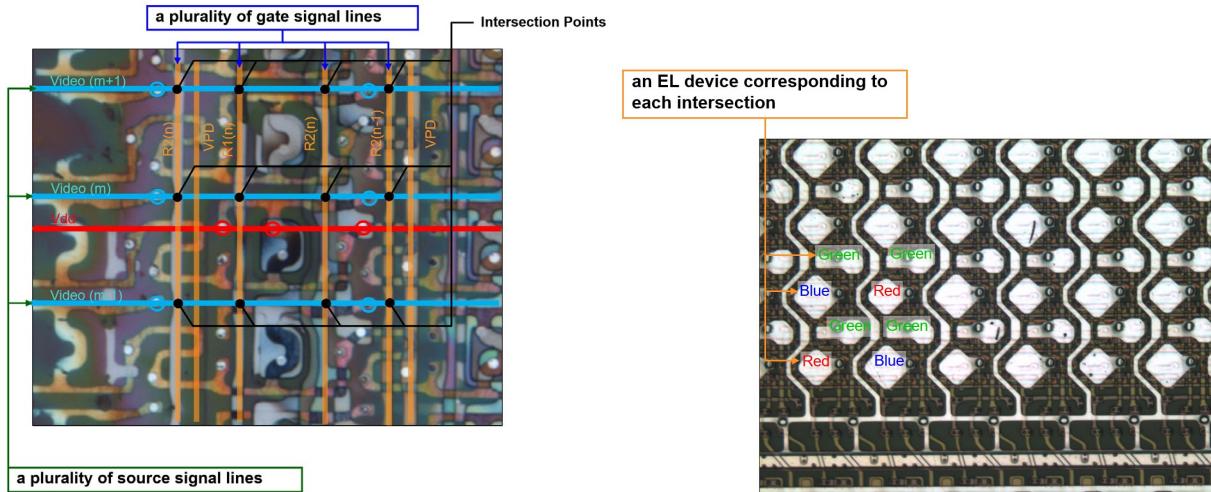
- a display screen including a plurality of gate signal lines which is arranged to intersect a plurality of source signal lines, and a pixel provided with an EL device corresponding to each intersection of the plurality of gate signal lines and the plurality of source signal lines;
- a driving transistor provided for each pixel to supply a current to the EL device;
- a first switch transistor provided for each pixel on a current path through which the current is supplied by the driving transistor to the EL device; and
- a gate driver circuit connected to the plurality of gate signal lines, wherein the gate driver circuit is configured to turn the first switch transistor on and off to simultaneously generate a plurality of band-shaped non-display regions and a plurality of band-shaped display regions on the display screen and to move the plurality of band-shaped non-display regions and the plurality of band-shaped display regions relative to the display screen, the plurality of band-shaped non-display regions being spaced apart on the display screen with one of the plurality of band-shaped display regions being between a pair of the plurality of band-shaped non-display regions, and the plurality of band-shaped display regions being spaced apart on the display screen with one of the plurality of band-shaped non-display regions being between a pair of the plurality of band-shaped display regions, and the gate driver circuit is configured to change a ratio of an area of the plurality of band-shaped non-display regions on the display screen to an area of the plurality of band-shaped display regions on the display screen depending on at least one of a brightness adjustment, a type of image data, or whether a display image is a motion image or a still image.

103. The Accused Products, including Samsung Galaxy smartphones, include an EL display apparatus, comprising: a display screen which includes a plurality of gate signal lines

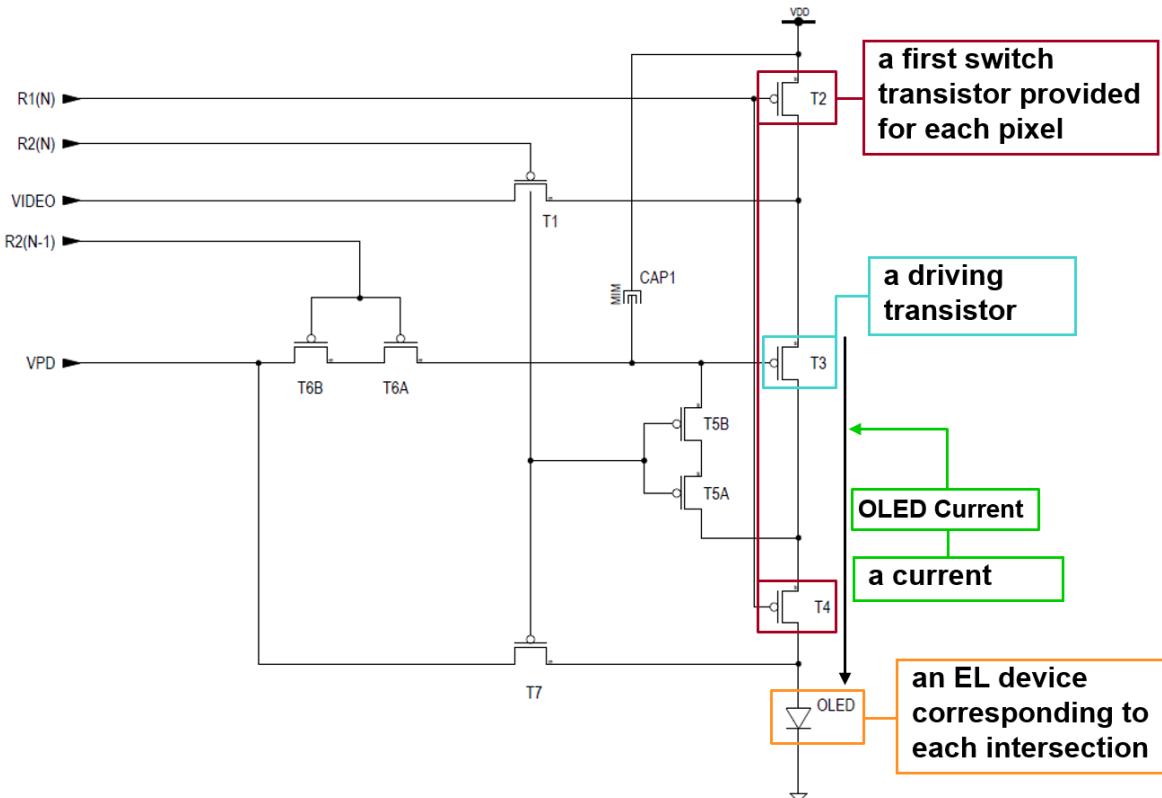
which is arranged to intersect a plurality of source signal lines, and a pixel provided with an EL device corresponding to each intersection of the plurality of gate signal lines and the plurality of source signal lines. For example, as shown in the photograph below, Samsung Galaxy smartphones include an EL display apparatus:



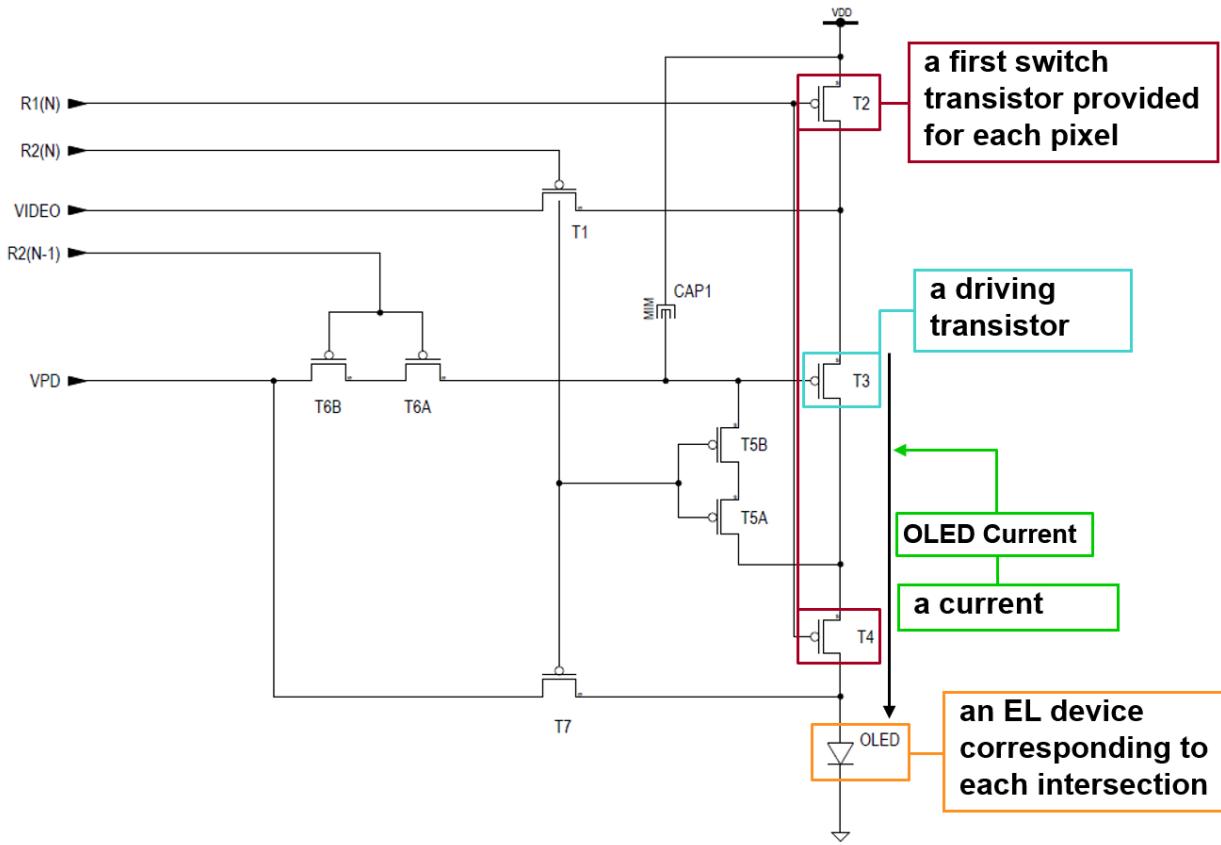
104. For example, as shown in the annotated photographs below, Samsung Galaxy smartphones include a display screen that includes a plurality of gate signal lines which is arranged to intersect a plurality of source signal lines, and a pixel provided with an EL device corresponding to each intersection of the plurality of gate signal lines and the plurality of source signal lines:



105. The Accused Products, including Samsung Galaxy smartphones, include a driving transistor provided for each pixel to supply a current to the EL device. For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones include a driving transistor provided for each pixel to supply a current to the EL device:

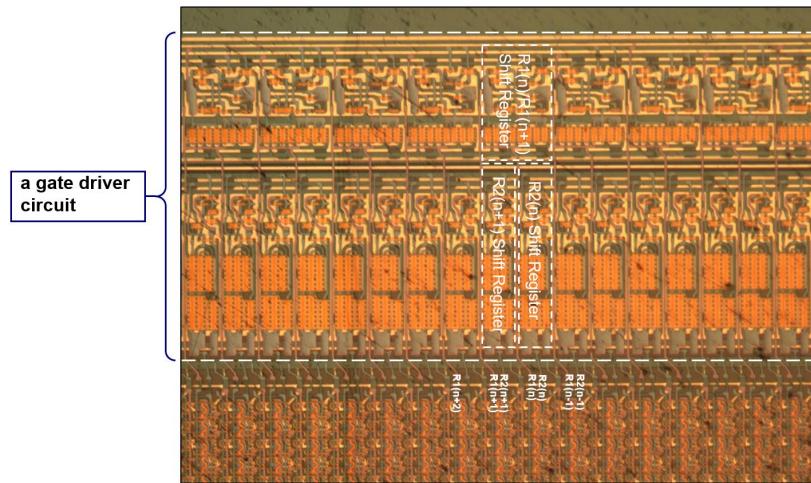


106. The Accused Products, including Samsung Galaxy smartphones, include a first switch transistor provided for each pixel on a current path through which the current is supplied by the driving transistor to the EL device. For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones include a first switch transistor provided for each pixel on a current path through which the current is supplied by the driving transistor to the EL device:



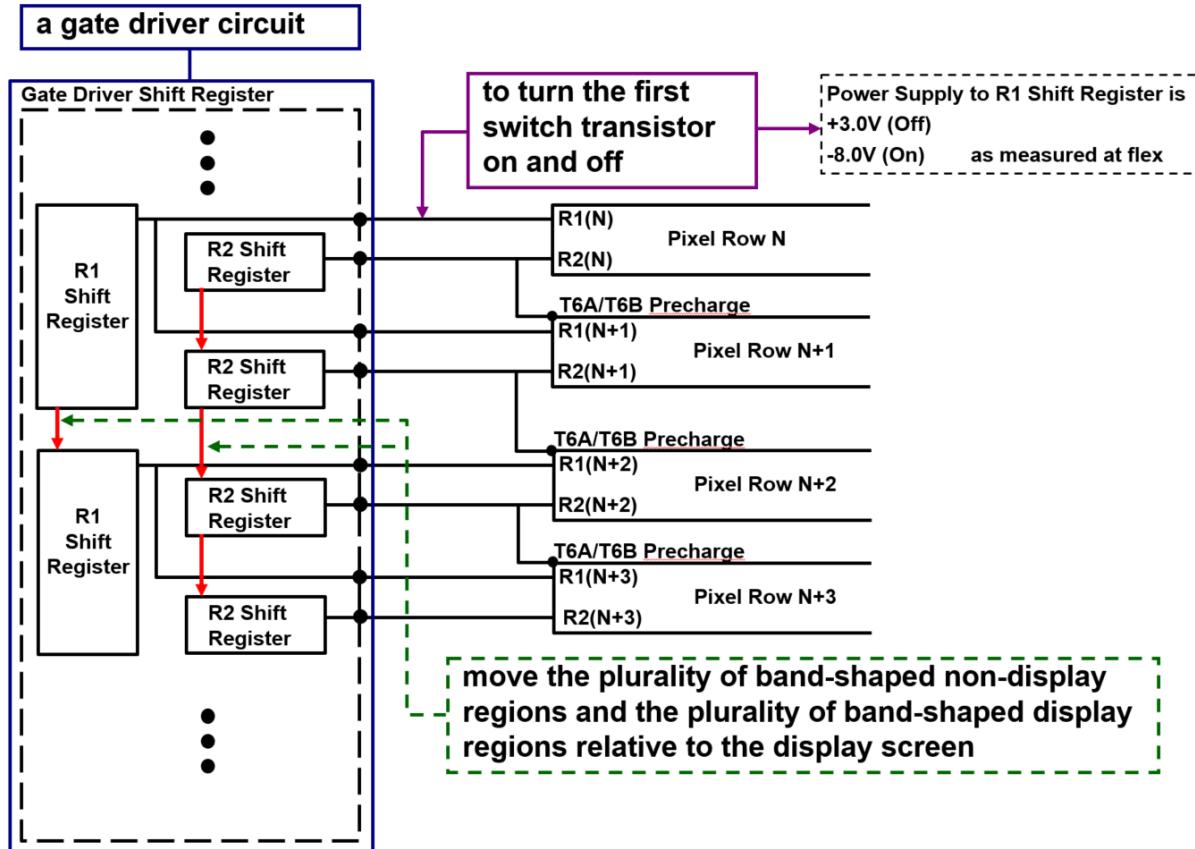
107. The Accused Products, including Samsung Galaxy smartphones, include a gate driver circuit connected to the plurality of gate signal lines, wherein the gate driver circuit is configured to turn the first switch transistor on and off to generate simultaneously a plurality of band-shaped non-display regions and a plurality of band-shaped display regions on the display screen and to move the plurality of band-shaped non-display regions and the plurality of band-shaped display regions relative to the display screen, the plurality of band-shaped

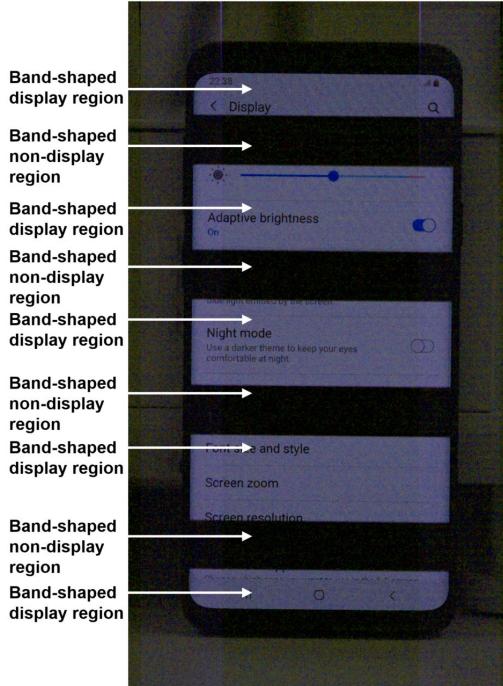
non-display regions being spaced apart on the display screen with one of the plurality of band-shaped display regions being between a pair of the plurality of band-shaped non-display regions, and the plurality of band-shaped display regions being spaced apart on the display screen with one of the plurality of band-shaped non-display regions being between a pair of the plurality of band-shaped display regions. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a gate driver circuit connected to the plurality of gate signal lines:



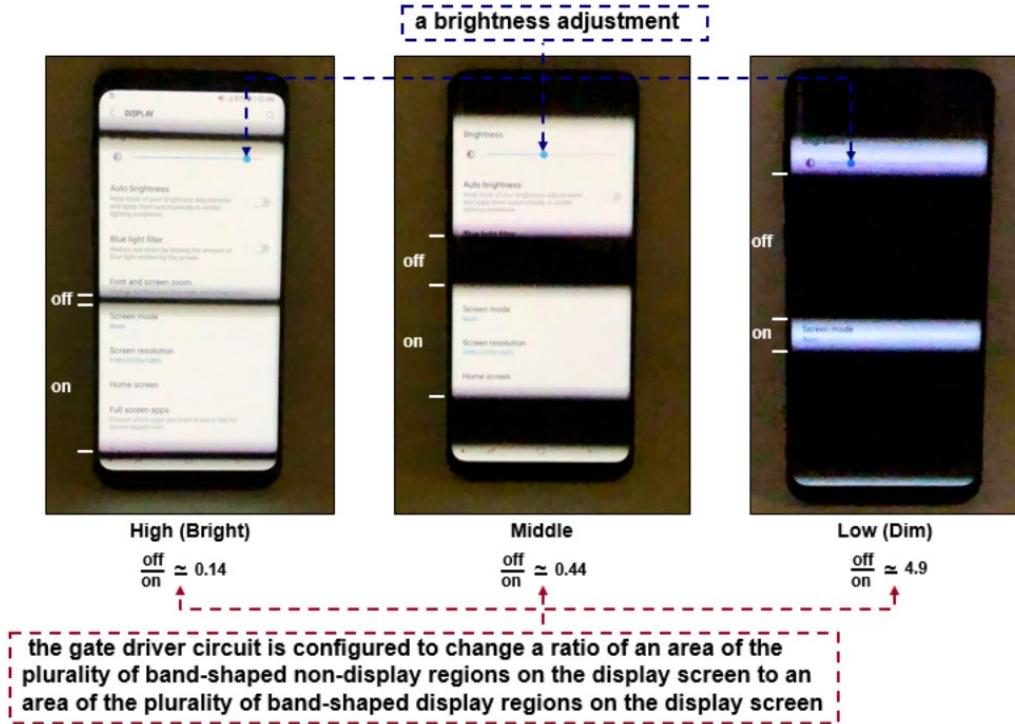
For example, as shown in the annotated circuit diagram and photograph below, Samsung Galaxy smartphones include a gate driver circuit wherein the gate driver circuit is configured to turn the first switch transistor on and off to generate simultaneously a plurality of band-shaped non-display regions and a plurality of band-shaped display regions on the display screen and to move the plurality of band-shaped non-display regions and the plurality of band-shaped display regions relative to the display screen, the plurality of band-shaped non-display regions being spaced apart on the display screen with one of the plurality of band-shaped display regions being between a pair of the plurality of band-shaped non-display regions, and the plurality of band-shaped display regions

regions being spaced apart on the display screen with one of the plurality of band-shaped non-display regions being between a pair of the plurality of band-shaped display regions:





108. In the Accused Products, including Samsung Galaxy smartphones, the gate driver circuit is configured to change a ratio of an area of the plurality of band-shaped non-display regions on the display screen to an area of the plurality of band-shaped display regions on the display screen depending on at least one of a brightness adjustment, a type of image data, or whether a display image is a motion image or a still image. For example, as shown in the annotated photographs below, in the Samsung Galaxy smartphones, the gate driver circuit is configured to change a ratio of an area of the plurality of band-shaped non-display regions on the display screen to an area of the plurality of band-shaped display regions on the display screen depending on at least one of a brightness adjustment, a type of image data, or whether a display image is a motion image or a still image:



109. Upon information and belief, Samsung has been and is currently actively inducing and encouraging infringement of the '336 Patent. Samsung actively encourages its customers to infringe at least claim 1 of the '336 Patent by supplying Accused Products and by encouraging the use of such Accused Products in a manner (e.g., operating the display with auto brightness activated or manually adjusting the brightness) that would necessarily lead to infringement of at least claim 1 of the '336 Patent. These facts give rise to a reasonable inference that Samsung knowingly induces its customers to infringe at least claim 1 of the '336 Patent directly, and that Samsung possesses a specific intent to cause such direct infringement. Samsung has been aware of the '336 Patent and of Samsung's infringement and Samsung's customers' infringement of the '336 Patent, since at least on or about May 15, 2020, when JOLED's counsel sent Samsung a letter attaching a copy of the '336 Patent and demanding that Samsung abate such infringement by taking a license or otherwise.

110. Upon information and belief, Samsung had knowledge of the '336 Patent before JOLED's counsel sent this letter to Samsung.

111. Samsung induces its customers to infringe by instructing its customers to turn on and/or operate the OLED display in the Accused Products. For example, Samsung provides a user manual for the Samsung Galaxy S9+ at [https://images.samsung.com/is/content/samsung/p5/ca/support/mobile-devices/galaxy-s9-plus-how-do-i-access-the-user-manual-on-my-samsung-galaxy-s9-plus/pdf/SM-G96X\\_UG\\_EN4.pdf](https://images.samsung.com/is/content/samsung/p5/ca/support/mobile-devices/galaxy-s9-plus-how-do-i-access-the-user-manual-on-my-samsung-galaxy-s9-plus/pdf/SM-G96X_UG_EN4.pdf). The user manual specifically instructs Samsung's customers to turn on the screen using the Home button to activate the "Always on Display." Additionally, Samsung instructs its customers how to "Enable Auto Brightness on Samsung devices" and states that "Auto Brightness is enabled by default."<sup>3</sup>

112. Upon information and belief, Samsung has committed and continues to commit all of the above acts of infringement despite Samsung's lack of a good-faith belief that at least claim 1 of the '336 Patent is not infringed, invalid, or unenforceable.

113. As a result of Samsung's infringement of the '336 Patent, JOLED has suffered damages and will continue to suffer damages. JOLED has been in compliance with 35 U.S.C. § 287(a) since at least on or about May 15, 2020. Moreover, JOLED has not made, offered for sale, or sold any articles patented under the '336 Patent within the United States, nor imported any articles patented under the '336 Patent into the United States. JOLED is not aware of any articles patented under the '336 Patent that have been made, offered for sale, or sold within the United States, or imported into the United States, by any person for or under JOLED.

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<sup>3</sup> <https://www.samsung.com/au/support/mobile-devices/how-do-i-enable-auto-brightness/>

114. Upon information and belief, Samsung's infringement of the '336 Patent has been and continues to be willful and deliberate. Samsung's pre-suit knowledge of the '336 Patent and pre-suit knowledge that Samsung's actions and the actions of Samsung's customers constitute infringement is sufficient to support a reasonable inference that Samsung knew, or should have known, that its subsequent actions posed an objective risk of infringement.

**COUNT V – INFRINGEMENT OF THE '992 PATENT**

115. JOLED hereby restates and re-alleges the allegations set forth in paragraphs 1 – 114 above and incorporates them by reference.

116. The Defendants have been and are now directly infringing and/or inducing each other and Samsung's customers to infringe the '992 Patent in this District and elsewhere in violation of 35 U.S.C. § 271 at least by using, selling, and/or offering to sell within the United States, and/or importing into the United States, Accused Products that practice at least claim 1 of the '992 Patent.

117. Samsung has committed infringing acts without the permission, consent, authorization, or license of JOLED.

118. Samsung's infringement is literal, under the doctrine of equivalents, or both.

119. Samsung infringes at least claim 1 of the '992 Patent as set forth below.

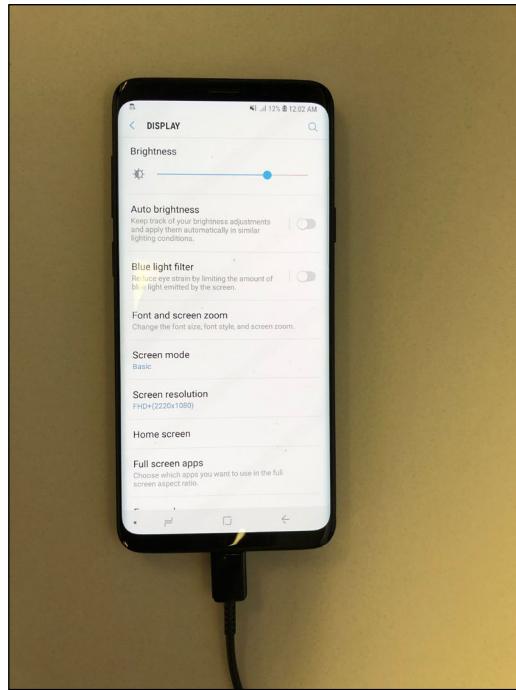
120. Independent claim 1 of the '992 Patent recites:

An electroluminescent (EL) display apparatus, comprising:

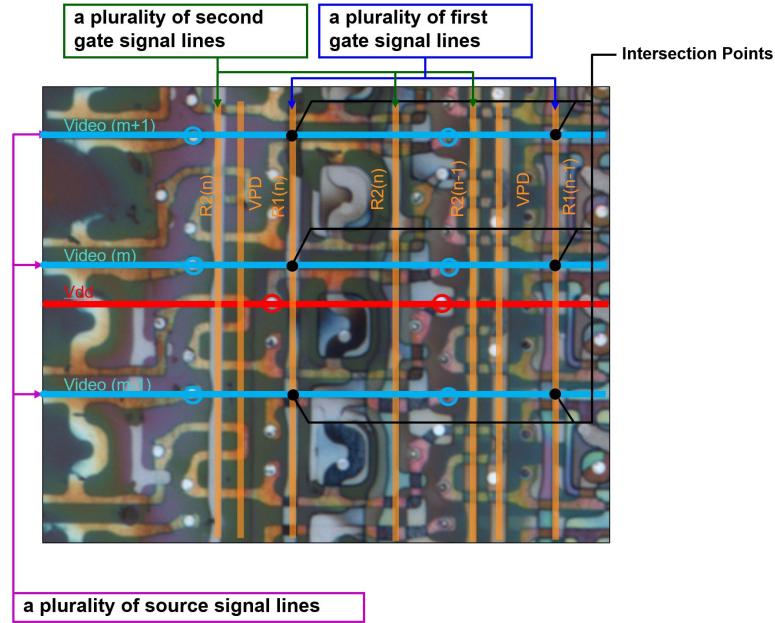
- a display screen including:
- a plurality of first gate signal lines;
- a plurality of second gate signal lines;
- a plurality of source signal lines; and

- a plurality of pixels arranged in a matrix, each pixel corresponding to an intersection of the plurality of first gate signal lines and the plurality of source signal lines; and
- a gate driver circuit including a first gate driver circuit connected to the plurality of first gate signal lines and a second gate driver circuit connected to the plurality of second gate signal lines, wherein each pixel includes:
  - an EL device including an anode terminal and a cathode terminal;
  - a driving transistor to flow a current to the EL device;
  - a first switch transistor provided on a current path through which the current flows from a power line through the driving transistor to the EL device, the first switch transistor being controlled by the first gate driver circuit;
  - a second switch transistor to supply, to the driving transistor, an image signal supplied from one of the plurality of source signal lines; and
  - a third switch transistor provided between the anode terminal of the EL device and a voltage line, the third switch transistor being controlled by the second gate driver circuit, the voltage line being configured to supply a reverse bias voltage for reverse biasing the anode terminal of the EL device, the first switch transistor is configured to be controlled in an OFF state by the first gate driver circuit, when the second gate driver circuit controls the third switch transistor in a state for reverse biasing the anode terminal of the EL device, and the first gate driver circuit is configured to turn the first switch transistor from an ON state to the OFF state, and, after a lapse of time, the second gate driver circuit is configured to turn the third switch transistor from an OFF state to an ON state for reverse biasing the anode terminal of the EL device.

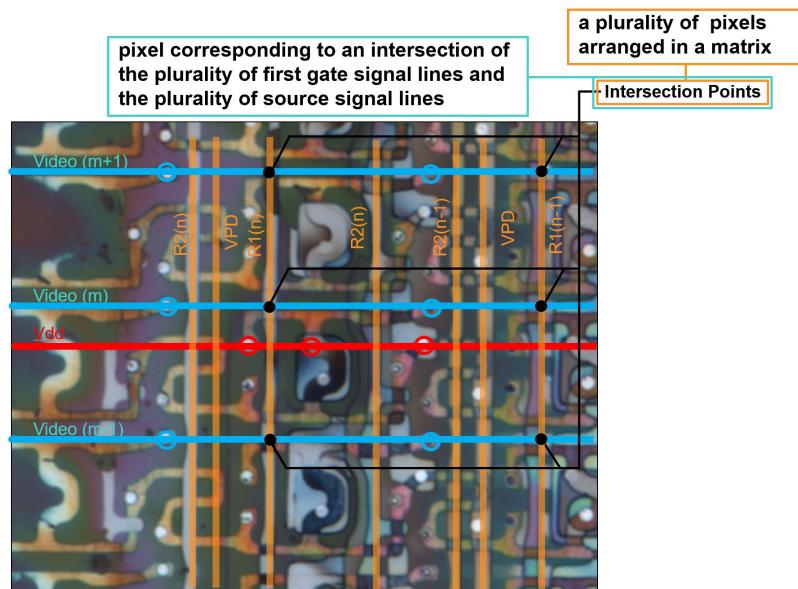
121. The Accused Products, including Samsung Galaxy smartphones, include an EL display apparatus comprising a display screen. For example, as shown in the photograph below, Samsung Galaxy smartphones include an EL display apparatus comprising a display screen:



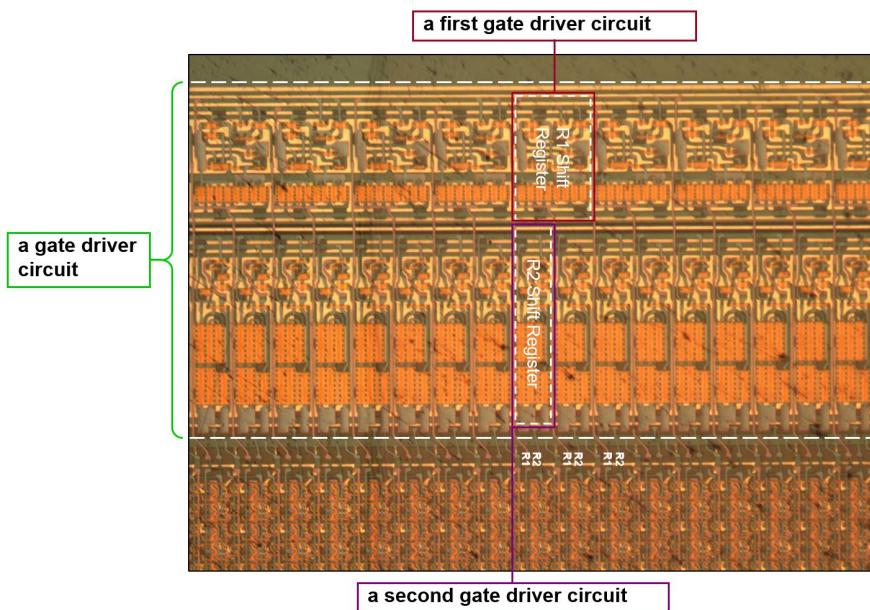
122. In the Accused Products, including Samsung Galaxy smartphones, the display screen includes: a plurality of first gate signal lines; a plurality of second gate signal lines; and a plurality of source signal lines. For example, as shown in the annotated photograph below, in the Samsung Galaxy smartphones, the display screen includes: a plurality of first gate signal lines; a plurality of second gate signal lines; and a plurality of source signal lines:

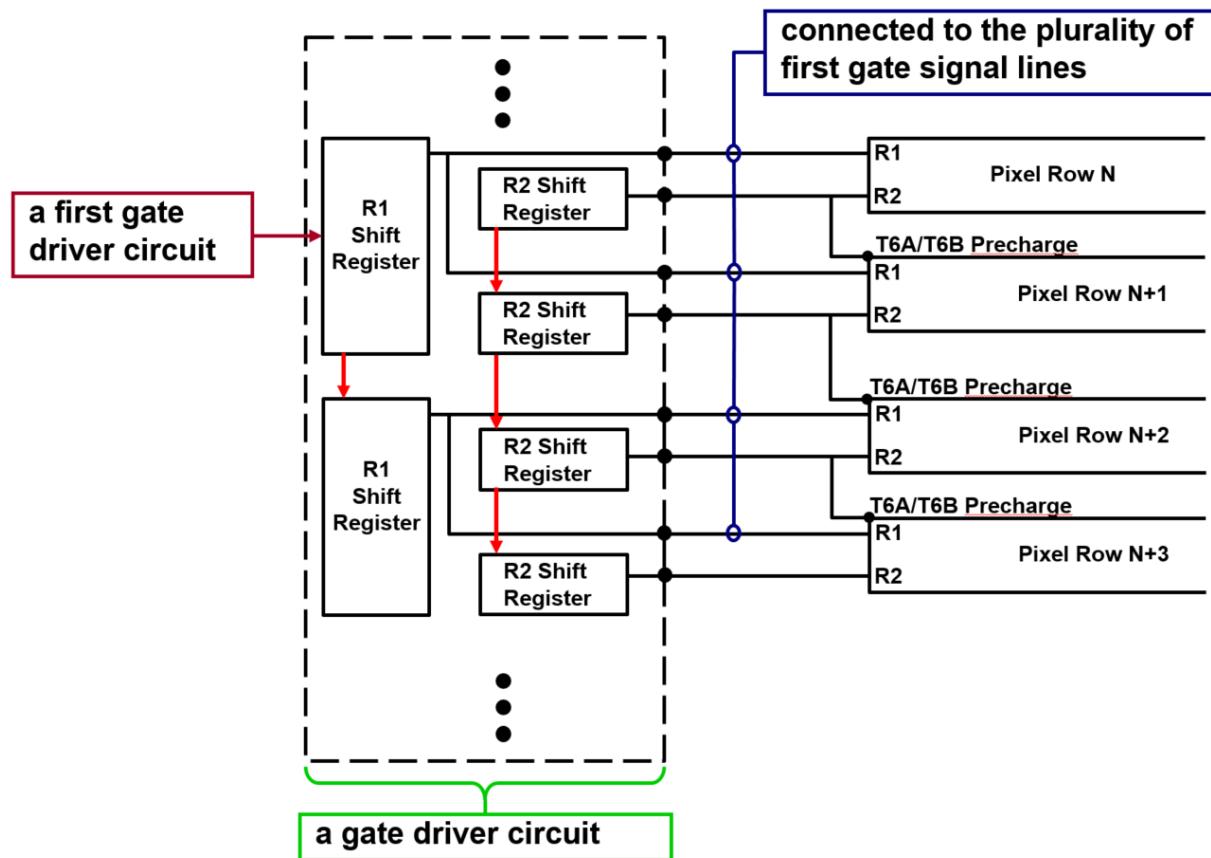


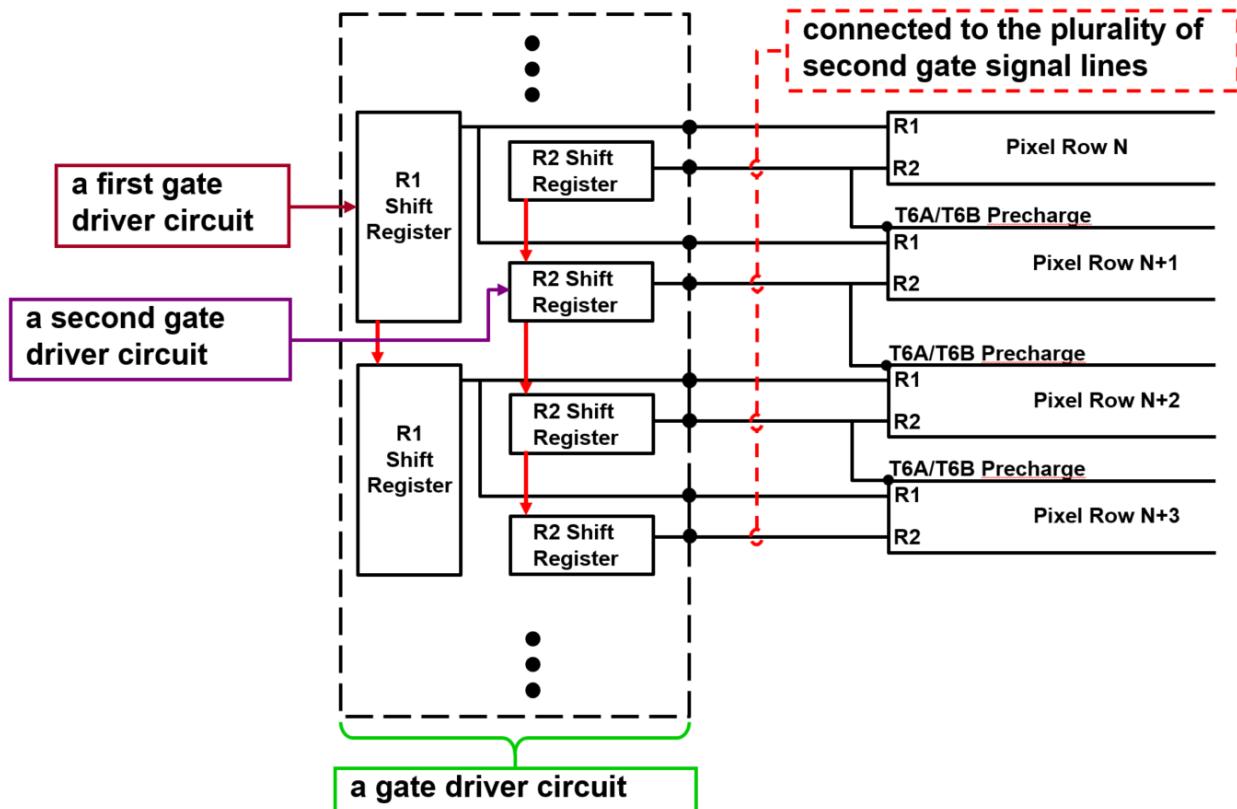
123. The Accused Products, including Samsung Galaxy smartphones, include a plurality of pixels arranged in a matrix, each pixel corresponding to an intersection of the plurality of first gate signal lines and the plurality of source signal lines. For example, as shown in the annotated photograph below, Samsung Galaxy smartphones include a plurality of pixels arranged in a matrix, each pixel corresponding to an intersection of the plurality of first gate signal lines and the plurality of source signal lines:



124. The Accused Products, including Samsung Galaxy smartphones, include a gate driver circuit that includes a first gate driver circuit connected to the plurality of first gate signal lines and a second gate driver circuit connected to the plurality of second gate signal lines. For example, as shown in the annotated photograph and circuit diagrams below, Samsung Galaxy smartphones include a gate driver circuit that includes a first gate driver circuit connected to the plurality of first gate signal lines and a second gate driver circuit connected to the plurality of second gate signal lines:

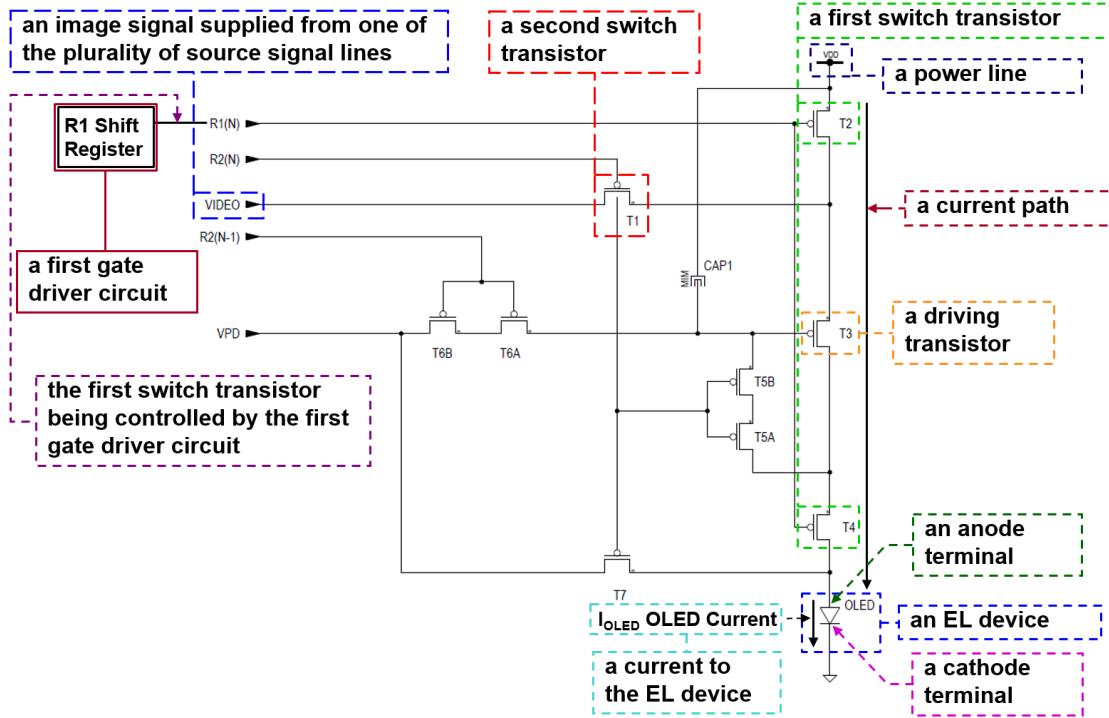




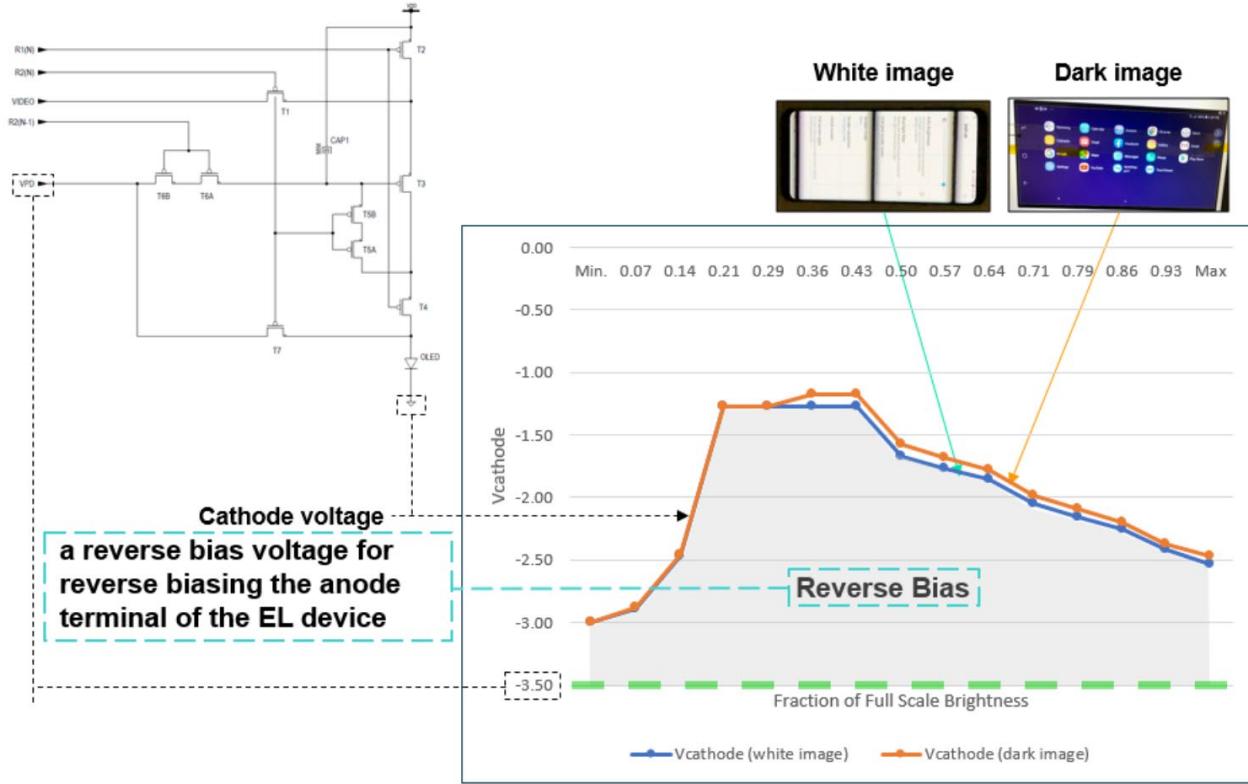
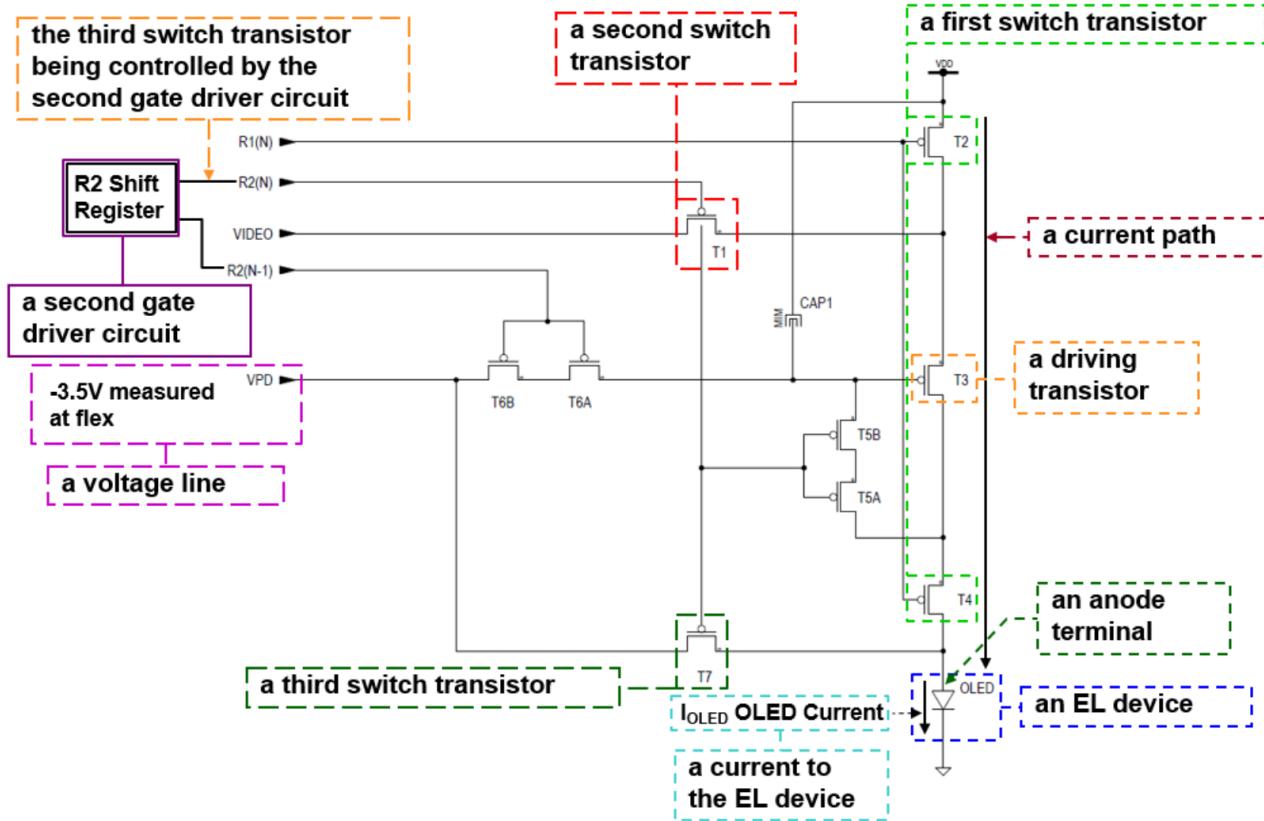


125. The Accused Products, including Samsung Galaxy smartphones, include a display screen wherein each pixel includes: an EL device which includes an anode terminal and a cathode terminal; a driving transistor to flow a current to the EL device; a first switch transistor provided on a current path through which the current flows from a power line through the driving transistor to the EL device, the first switch transistor being controlled by the first gate driver circuit; and a second switch transistor to supply, to the driving transistor, an image signal supplied from one of the plurality of source signal lines. For example, as shown in the annotated circuit diagram below, Samsung Galaxy smartphones, include a display screen wherein each pixel includes: an EL device which includes an anode terminal and a cathode terminal; a driving transistor to flow a current to the EL device; a first switch transistor provided on a current path through which the current flows from a power line through the driving transistor to the EL device, the first switch transistor being

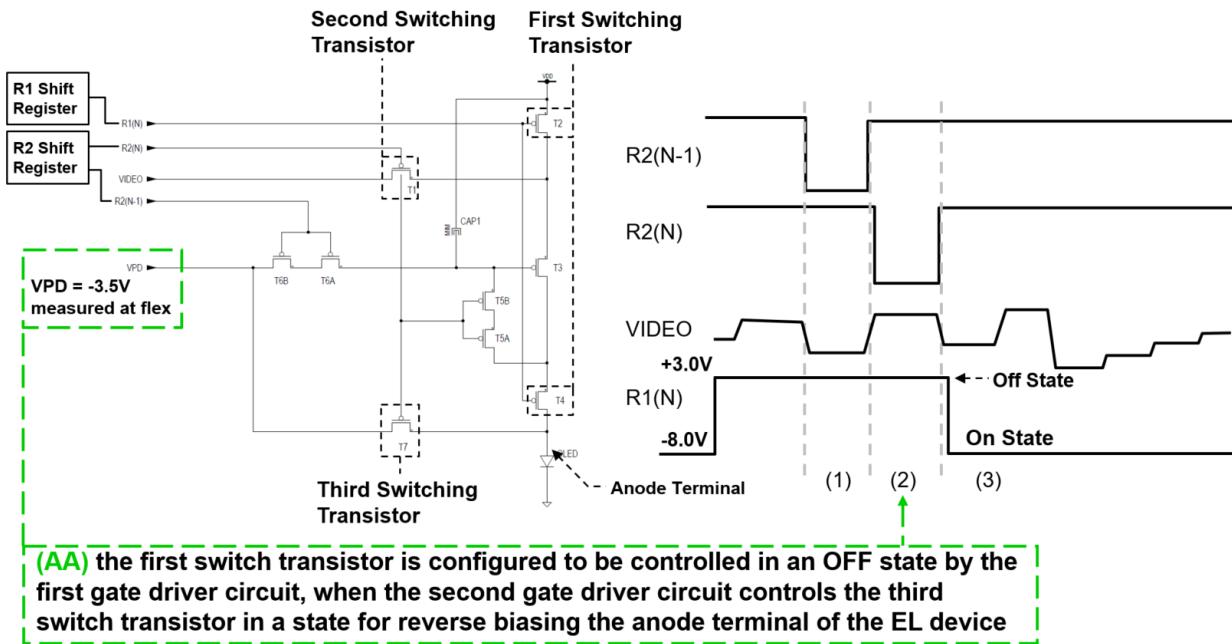
controlled by the first gate driver circuit; and a second switch transistor to supply, to the driving transistor, an image signal supplied from one of the plurality of source signal lines:

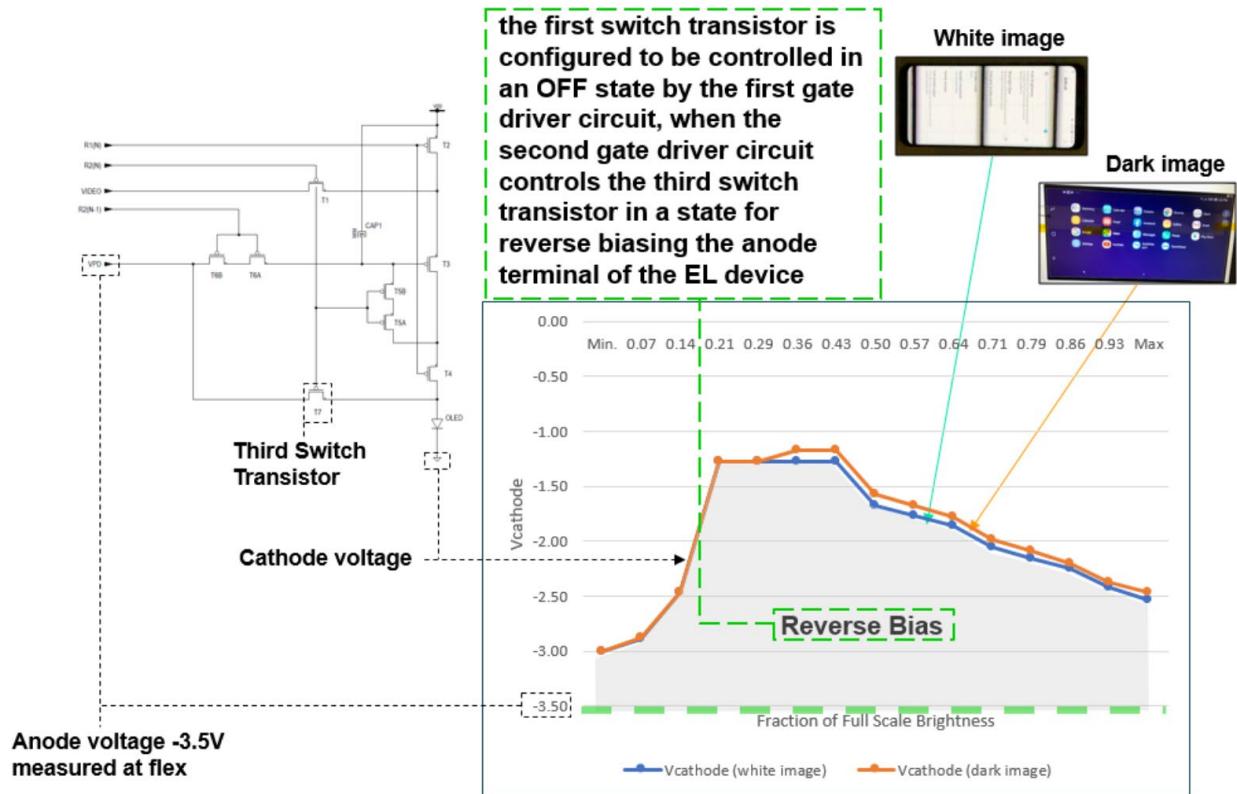


126. The Accused Products, including Samsung Galaxy smartphones, include a display screen wherein each pixel includes: a third switch transistor provided between the anode terminal of the EL device and a voltage line, the third switch transistor being controlled by the second gate driver circuit, the voltage line being configured to supply a reverse bias voltage for reverse biasing the anode terminal of the EL device. For example, as shown in the annotated circuit diagrams below, Samsung Galaxy smartphones, include a display screen wherein each pixel includes: a third switch transistor provided between the anode terminal of the EL device and a voltage line, the third switch transistor being controlled by the second gate driver circuit, the voltage line being configured to supply a reverse bias voltage for reverse biasing the anode terminal of the EL device:

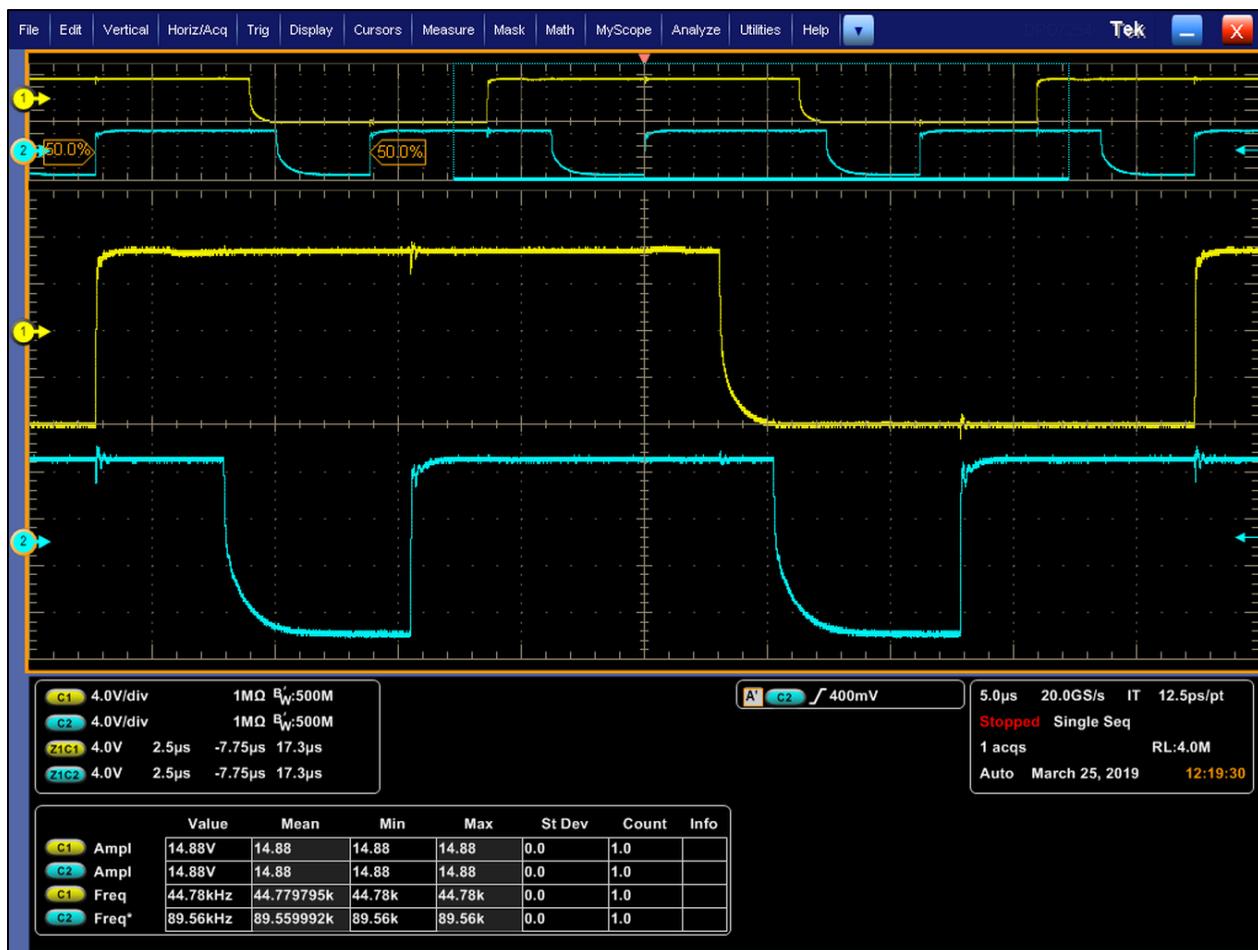
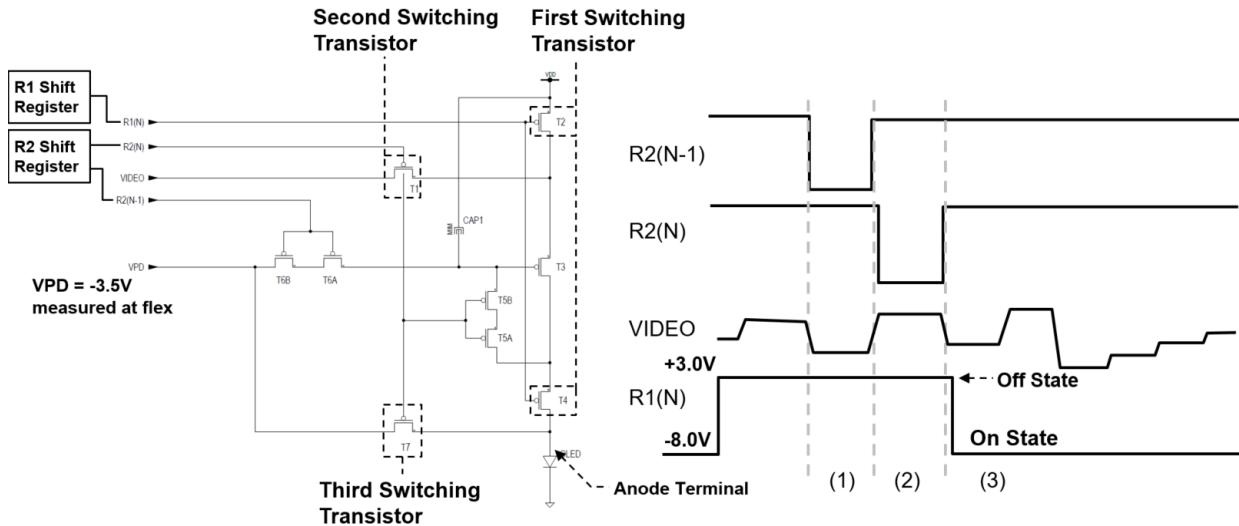


127. The Accused Products, including Samsung Galaxy smartphones, include a display screen wherein each pixel includes: the first switch transistor configured to be controlled in an OFF state by the first gate driver circuit, when the second gate driver circuit controls the third switch transistor in a state for reverse biasing the anode terminal of the EL device. For example, as shown in the annotated circuit diagrams below, Samsung Galaxy smartphones, include a display screen wherein each pixel includes: the first switch transistor configured to be controlled in an OFF state by the first gate driver circuit, when the second gate driver circuit controls the third switch transistor in a state for reverse biasing the anode terminal of the EL device:





128. The Accused Products, including Samsung Galaxy smartphones, include a display screen wherein each pixel includes: the first gate driver circuit configured to turn the first switch transistor from an ON state to the OFF state, and, after a lapse of time, the second gate driver circuit configured to turn the third switch transistor from an OFF state to an ON state for reverse biasing the anode terminal of the EL device. For example, as shown in the annotated circuit diagrams below, Samsung Galaxy smartphones, include the first gate driver circuit configured to turn the first switch transistor from an ON state to the OFF state, and, after a lapse of time, the second gate driver circuit configured to turn the third switch transistor from an OFF state to an ON state for reverse biasing the anode terminal of the EL device:



129. Upon information and belief, Samsung has been and is currently actively inducing and encouraging infringement of the '992 Patent. Samsung actively encourages its customers to

infringe at least claim 1 of the '992 Patent by supplying Accused Products and by encouraging the use of such Accused Products in a manner (e.g., operating the OLED display) that would necessarily lead to infringement of at least claim 1 of the '992 Patent. These facts give rise to a reasonable inference that Samsung knowingly induces its customers to infringe at least claim 1 of the '992 Patent directly, and that Samsung possesses a specific intent to cause such direct infringement. Samsung has been aware of the '992 Patent and of Samsung's infringement and Samsung's customers' infringement of the '992 Patent, since at least on or about May 15, 2020, when JOLED's counsel sent Samsung a letter attaching a copy of the '992 Patent and demanding that Samsung abate such infringement by taking a license or otherwise.

130. Upon information and belief, Samsung had knowledge of the '992 Patent before JOLED's counsel sent this letter to Samsung.

131. Samsung induces its customers to infringe by instructing its customers to turn on and/or operate the OLED display in the Accused Products. For example, Samsung provides a user manual for the Samsung Galaxy S9+ at

[https://images.samsung.com/is/content/samsung/p5/ca/support/mobile-devices/galaxy-s9-plus-how-do-i-access-the-user-manual-on-my-samsung-galaxy-s9-plus/pdf/SM-G96X\\_UG\\_EN4.pdf](https://images.samsung.com/is/content/samsung/p5/ca/support/mobile-devices/galaxy-s9-plus-how-do-i-access-the-user-manual-on-my-samsung-galaxy-s9-plus/pdf/SM-G96X_UG_EN4.pdf).

The user manual specifically instructs Samsung's customers to turn on the screen using the Home button to activate the "Always on Display."

132. Upon information and belief, Samsung has committed and continues to commit all of the above acts of infringement despite Samsung's lack of a good-faith belief that at least claim 1 of the '992 Patent is not infringed, invalid, or unenforceable.

133. As a result of Samsung's infringement of the '992 Patent, JOLED has suffered damages and will continue to suffer damages. JOLED has been in compliance with 35 U.S.C.

§ 287(a) since at least on or about May 15, 2020. Moreover, JOLED has not made, offered for sale, or sold any articles patented under the '992 Patent within the United States, nor imported any articles patented under the '992 Patent into the United States. JOLED is not aware of any articles patented under the '992 Patent that have been made, offered for sale, or sold within the United States, or imported into the United States, by any person for or under JOLED.

134. Upon information and belief, Samsung's infringement of the '992 Patent has been and continues to be willful and deliberate. Samsung's pre-suit knowledge of the '992 Patent and pre-suit knowledge that Samsung's actions and the actions of its customers constitute infringement is sufficient to support a reasonable inference that Samsung knew, or should have known, that its subsequent actions posed an objective risk of infringement.

#### **PRAYER FOR RELIEF**

WHEREFORE, JOLED respectfully requests that the Court enter judgment in favor of JOLED and prays that the Court grant the following relief to JOLED:

- A. A judgment that each of the Defendants has infringed method claim 13 of the '130 Patent;
- B. A judgment that each of the Defendants has infringed at least claim 1 of the '597 Patent;
- C. A judgment that each of the Defendants has infringed at least claim 16 of the method claims of the '108 Patent;
- D. A judgment that each of the Defendants has infringed at least claim 1 of the '336 Patent;
- E. A judgment that each of the Defendants has infringed at least claim 1 of the '992 Patent;

F. An award of damages adequate to compensate for Samsung's infringement of the Asserted Patents, including all pre-judgment and post-judgment interest at the maximum rate permitted by law;

G. An accounting for infringing sales not presented at trial and an award of additional damages for any such infringing sales;

H. An award of trebled damages under 35 U.S.C. § 284;

I. A declaration that this case is exceptional under 35 U.S.C. § 285;

J. An award of JOLED's costs and attorneys' fees under 35 U.S.C. § 285; and

K. Any other legal or equitable remedy to which JOLED may be entitled.

**JURY DEMAND**

Pursuant to Rule 38(b) of the Federal Rule of Civil Procedure, JOLED hereby demands trial by jury on all issues raised by the complaint.

Dated: June 22, 2020

Respectfully submitted,

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